CONSISTENT BUILDING RECORD

OF

The Skinner & Eddy Corporation—Plant No. 1

FOR TWO YEARS

FROM

3 Building Berths for the First Year
5 Building Berths for the Second Year

Also launched S. S. West Cressy, first ship from Plant No. 2 on September 21st, 60 working days from keel to launching

Name	D.W.T.	Keel Laid	Launched	Delivered	Keel to Launch Wkg. Days	Keel to Launch Cal. Days	Launch to Delivery Wkg. Days	Launch to Delivery Cal. Days	Total Keel to Deliv. Wkg. Days	Total Keel to Deliv. Cal. Days
NIELS NIELSEN	8800	May 2, '16	Sept. 21, '16	Nov. 9, '16	119	143	41	50	160	193
HANNA NIELSEN	8800	May 11, '16	Oct. 21, '16	Dec. 22, '16	137	164	51	53	188	227
LUISE NIELSEN	8800	Sept. 23, '16	Jan. 23, '17	Mar. 10, '17	100	133	39	47	139	180
S. V. HARKNESS	10000	Aug. 15, '16	Mar. 22, '17	May 8, '17	188	220	40	48	223	268
JOSIAH MACY	10000	Oct. 23, '16	Apr. 21, '17	June 9, '17	151	180	40	50	191	230
STOLT NIELSEN	8800	Jan. 30, '17	May 22, '17	June 26, '17	96	113	28	36	124	149
JEAN SKINNER	8800	Mar. 27, '17	June 30, '17	Aug. 20, '17	81	96	41	52	122	148
LT. DeMISSIESSY	8800	Apr. 25, '17	Aug. 16, '17	Sept. 19, '17	94	114	27	36	121	150
INDIANA	8800	May 25, '17	Sept. 15, '17	Oct. 20, '17	93	114	29	36	122	150
WEST HAVEN	8800	Aug. 13, '17	Nov. 1, '17	Dec. 24, '17	67	81	43	54	110	135
SEATTLE	8800	Aug. 21, '17	Nov. 24, '17	Jan. 5, '18	80	96	33	43	113	139
TRONTOLITE	10000	July 3, '17	Dec. 15, '17	Feb. 2, '18	138	166	39	50	177	216
ABSAROKA	8800	Sept. 5, '17	Dec. 22, '17	Feb. 12, '18	91	109	41	53	132	168
WEST ARROW	8800	Sept. 20, '17	Jan. 19, '18	Feb. 26, '18	100	122	31	39	131	161
WESTLAKE	8800	Nov. 8, '17	Feb. 9, '18	Mar. 9, '18	76	94	23	29	99	123
CANOGA	8800	Dec. 1, '17	Feb. 26, '18	Mar. 23, '18	71	88	21	26	92	114
OSSINEKE	8800	Dec. 26, '17	Mar. 14, '18	Apr. 13, '18	65	79	25	31	90	110
WESTERN QUEEN	8800	Jan. 2, '18	Mar. 28, '18	Apr. 25, '18	72	88	23	29	95	117
WEST DURFEE	8800	Jan. 25, '18	Apr. 11, '18	May 16, '18	64	76	29	36	93	112
WEST LIANGA	8800	Feb. 14, '18	Apr. 20, '18	May 4, '18	55	65	11	15	66	80
WEST ALSEK	8800	Mar. 4, '18	May 11, '18	June 14, '18	58	68	19	25	77	93
WEST APAUM	8800	Mar. 19, '18	May 23, '18	June 19, '18	55	65	22	28	77	93
WEST COHAS	8800	Apr. 2, '18	June 4, '18	June 29, '18	52	62	21	26	73	88
WEST EKONK	8800	Apr. 16, '18	June 22, '18	July 13, '18	57	67	16	22	73	89
WEST GAMBO	8800	Apr. 25, '18	July 4, '18	July 20, '18	59	70	13	17	72	87
WEST GOTOMSKA	8800	May 16, '18	July 17, '18	Aug. 7, '18	51	62	17	21	68	83
WEST HOBOMAC	8800	May 29, '18	July 27, '18	Aug. 17, '18	49	59	17	21	66	80
WEST HOSOKIE	8800	June 11, '18	Aug. 15, '18	Aug. 29, '18	54	65	11	14	65	79
WEST HUMHAW	8800	June 27, '18	Aug. 28, '18	Sept. 14, '18	51	62	14	17	65	79
WEST LASHAWAY	8800	July 8, '18	Sept. 12, '18	Sept. 28, '18	55	66	13	17	68	83
WEST LOQUASSUCK	8800	July 20, '18	Sept. 21, '18		50	64				

SKINNER & EDDY
CORPORATION
BUILDERS OF STEEL STEAMSHIPS
SEATTLE WASHINGTON

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DE LAVAL

Centrifugal
OIL PURIFIER

Eliminates water, grit and ***carbon*** *from Lubricating Oil—making it as good as new*

Every motorship owner and operator will be interested in the De Laval System of purifying and reclaiming lubricating oil used in marine engines and bearings.

The De Laval Centrifugal Oil Purifier separates oil from water and removes foreign matter, such as dust, metallic particles and **carbon.**

It makes the used oil as good as new, eliminates the dangers of a clogged oil system and helps maintain the factor of safety originally calculated by the designers by keeping water, grit and carbon out of cylinders and bearings. It is now in use on vessels of various types.

De Laval Centrifugal Oil Purifier Motor Driven

The Purifier is a small, compact machine, taking up less than two square feet of floor space and requiring less than one H. P. to drive. It is positive and instantaneous in action and is not affected by the motion of the ship.

Every ship should be equipped with a De Laval Oil Purifier. Furnished with direct electric drive or direct steam turbine with ball governor.

Full details furnished on application.

THE DE LAVAL SEPARATOR CO.

165 Broadway, New York **29 East Madison Street, Chicago**

World's Largest Makers of Centrifugal Machinery

Manufacturers' Selling Agents

De Laval Steam Turbine Co.
TRENTON, N. J.

De Laval Dairy Supply Co.
SAN FRANCISCO

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The

U. S. Government

Has Publicly Acknowledged

2,000,000

times through Mr. Edward N. Hurley, Chairman of the U. S. SHIPPING BOARD that the oil-engined motorship is the most efficient cargo carrier known to engineering science in an article entitled **"When Coal-oil Johnny Goes to Sea"** in the *"Saturday Evening Post"* of December 14, 1918.

This is what

MOTORSHIP

DEVOTED TO THE MERCHANT MARINE

has maintained from its first issue, and were it not for the unabated energy and investigation work of MOTORSHIP we believe there would not be 78 Diesel-type oil-engined, ships, now building for the U. S. Government today.

The War is over, so, also is the emergency for inefficient prime movers in our Merchant Marine

Manufacturers and builders of every article entering into the construction of motorships **what does this mean to you?** The U. S. Government has on order 7½ million dollars worth of merchant ship Diesel engines, and about an equal amount in naval-type Diesel engines now building. Total $15,000,000.00 in Diesel engines.

Can you read the handwriting on the wall?

Advertising Space in MOTORSHIP is at your disposal! May we send you rates?

MOTORSHIP

NEW YORK
South Ferry Building

SEATTLE
L. C. Smith Building

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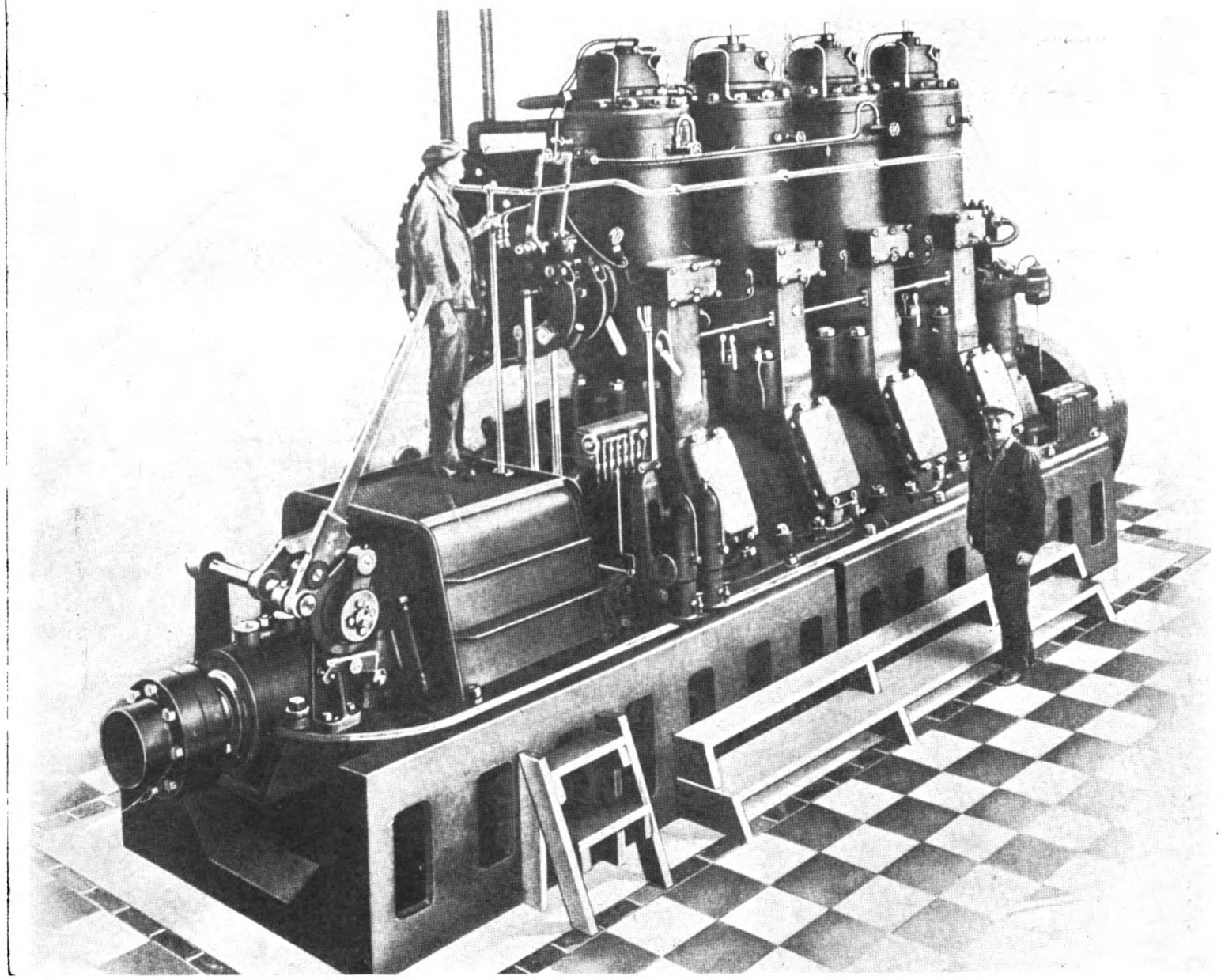
BOLINDER'S

Over 13,500 Engines Now in Service. 650,000 B. H. P. in Use in All Parts of the World



500 B. H. P. (500 to 600 B. H. P.) Model "M11." 160 Revolutions per M. (without water injection). (Guaranteed for continuous overload of 10%)

The BOLINDER

THE ENGINE THAT IS NOT A DIESEL
THE ENGINE THAT IS NOT A SEMI-DIESEL
THE ENGINE THAT IS THE BOLINDER
THE STANDARD FOR SURFACE-IGNITION FUEL OIL ENGINES

HENRY LUND & COMPANY

MARINE BUILDING, SAN FRANCISCO, CALIFORNIA

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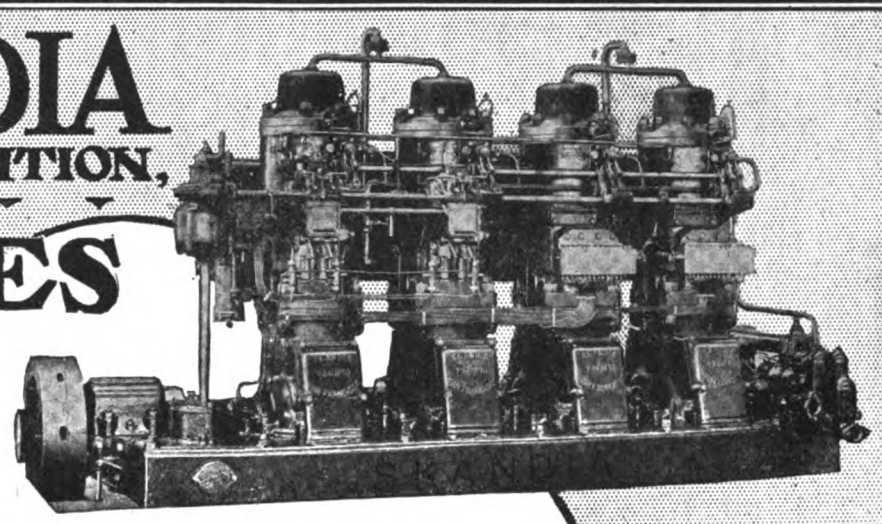
SKANDIA
SURFACE IGNITION, HEAVY OIL ENGINES



SKANDIA ENGINES are built in standard sizes from 5 to 500 H. P. They are the logical engine for moderate speed vessels. They are economical, reliable, and run on low fuel consumption.

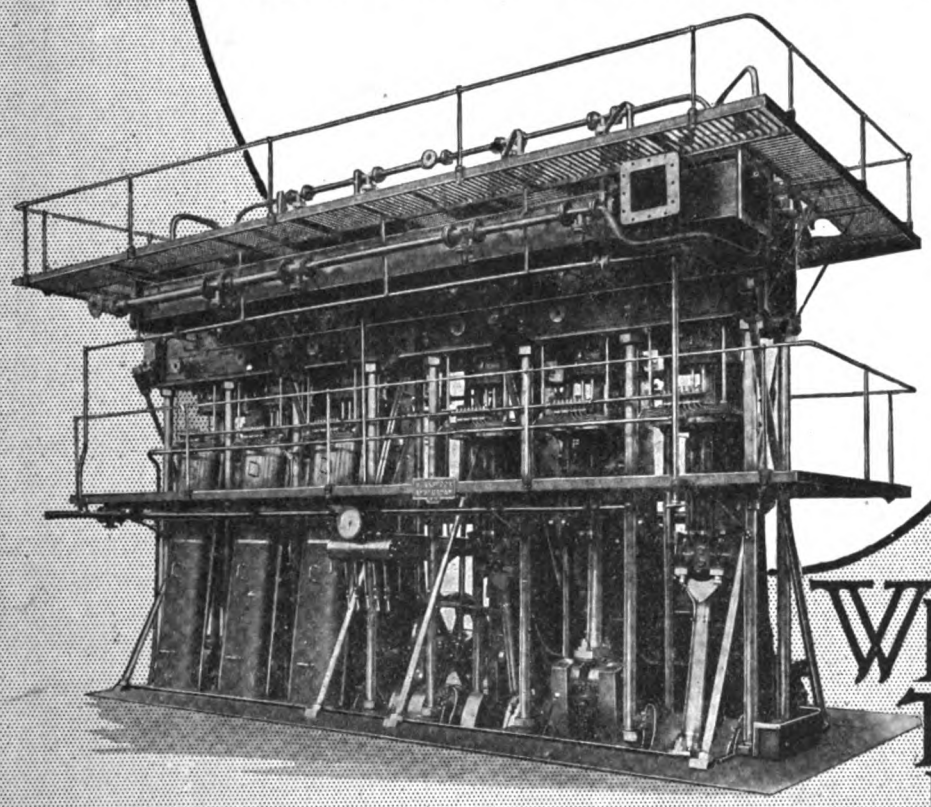
WERKSPOOR DIESEL ENGINES represent the most modern type of Diesel Engine, embodying every refinement. Engines of the 4-cycle type built from 340 H. P. and up. All engines built in U. S. A.

H. S. JOHANNSEN

50 CHURCH STREET, NEW YORK

Cable Address: "HESMIJO" Telephone: 3462 CORTLANDT

Agent for Atlantic Coast, Great Lakes, Gulf and Cuba of the SKANDIA PACIFIC OIL ENGINE CO., OAKLAND, CALIF.



WERKSPOOR TRUE DIESEL ENGINES

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Don't pump your dirty oil overboard—install the

DE LAVAL

Centrifugal Oil Purification

PROCESS

which instantly takes the carbon, the grit and the water out of it —making it as good as new

It is the only method which effects complete purification. That's why it is approved by the Emergency Fleet Corporation and is in use on numerous vessels of various kinds.

The process consists mainly of a De Laval Centrifugal Oil Purifier, which is not affected by the motion of the ship, occupies less than two square feet of space and requires less than 1 H. P. to drive.

De Laval Centrifugal Oil Purifier Motor Driven

Write nearest office for full information.

THE DE LAVAL SEPARATOR CO.

165 Broadway, New York **29 East Madison Street, Chicago**

World's Largest Makers of Centrifugal Machinery

Manufacturers' Selling Agents

De Laval Steam Turbine Co.
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SAN FRANCISCO

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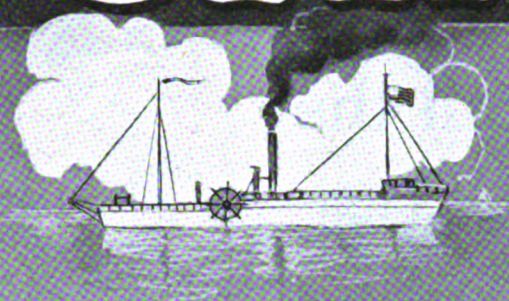

THEN

The art of making forgings was no more advanced than the art of ship building · But to-day ·

CAMDEN FORGINGS

Are made for propelling and handling the largest steamers · You must know of our modern shops and equipments · We are working in the

NOW

CAMDEN FORGE CO.
CAMDEN, N.J., U.S.A.

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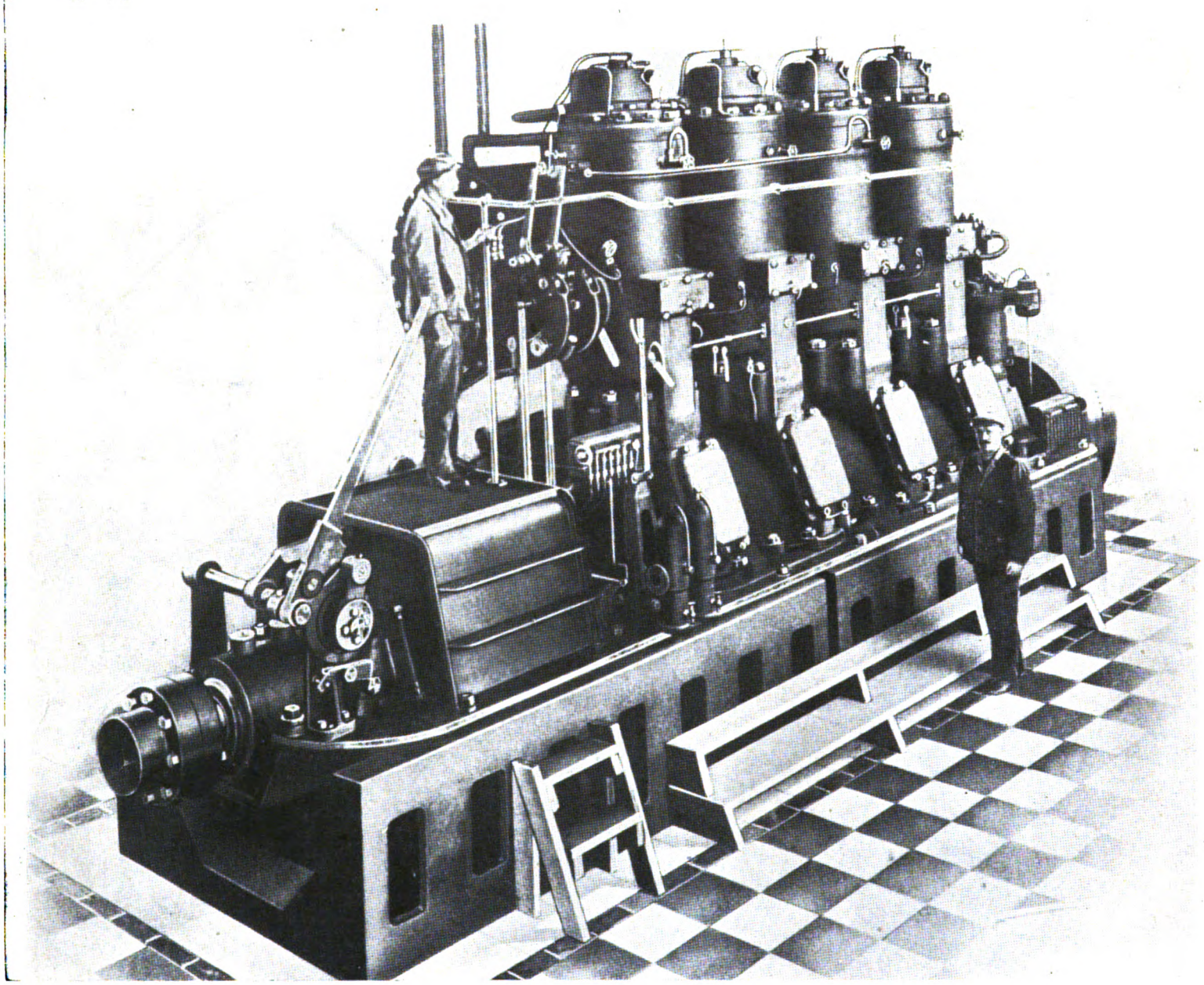
BOLINDER'S

Over 13,500 Engines Now in Service. 650,000 B. H. P. in Use in All Parts of the World



500 B. H. P. (500 to 600 B. H. P.) Model "M11." 160 Revolutions per M. (without water injection). (Guaranteed for continuous overload of 10%)

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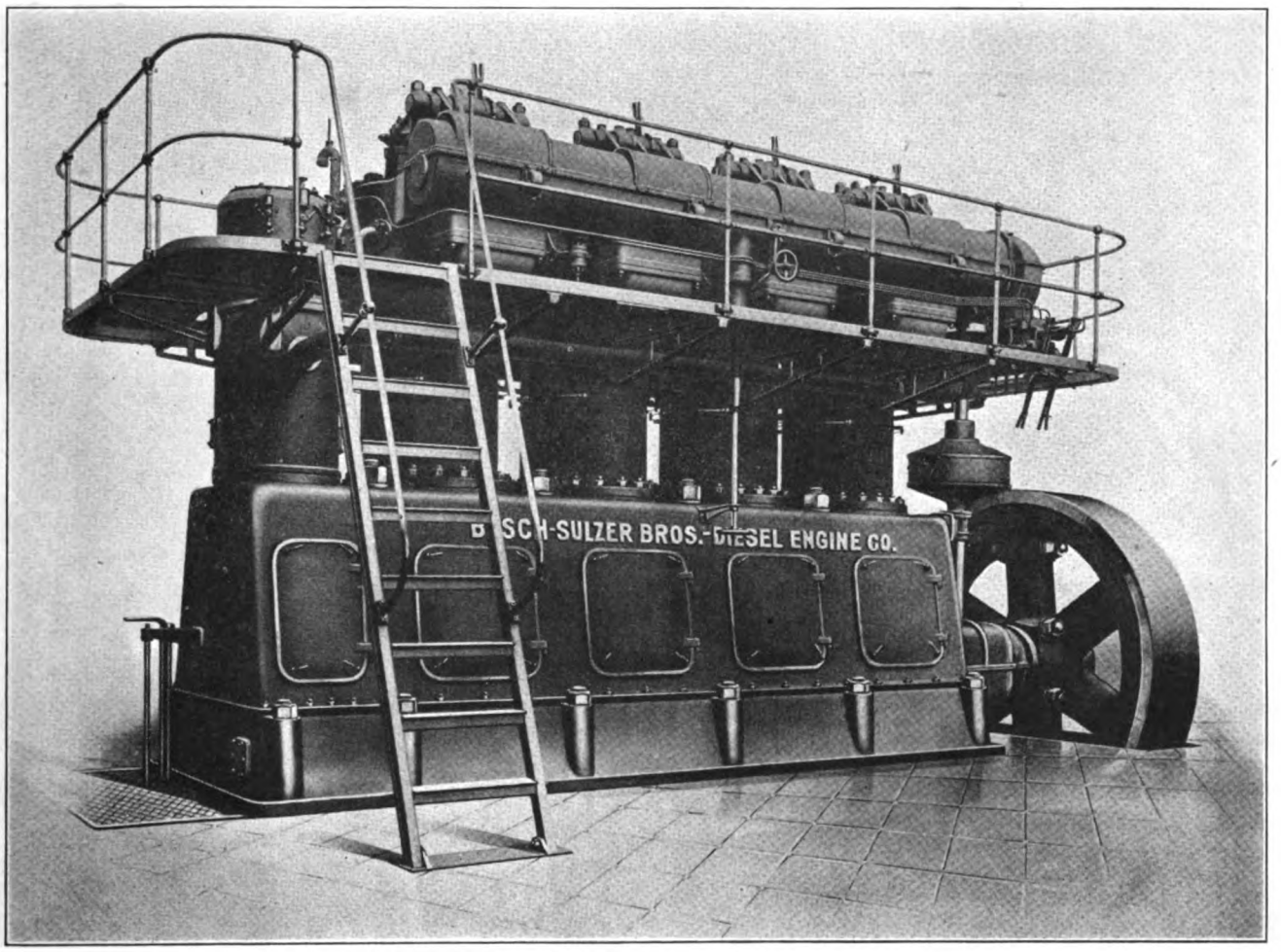
BUSCH-SULZER-DIESEL

STATIONARY AND MARINE
DIESEL OIL ENGINES



520 B.H.P. — TYPE "B" DIESEL ENGINE STATIONARY AND MARINE AUXILIARY

We can offer early shipments of the following sizes: 120 B.H.P., 165 B.H.P., 365 B.H.P., and 520 B.H.P.

DESIGNERS AND BUILDERS OF DIESEL ENGINES SINCE 1898.

Owners of all Diesel Engine Rights and Experiences in and for the U. S. A. and its Possessions; Panama, and Canada; of the Diesel Motor Company of America; the American Diesel Engine Company; Sulzer Freres of Winterthur, Switzerland; Rudolf Diesel, Inventor of the Engine.

BUSCH-SULZER BROS.-DIESEL ENGINE CO.
ST. LOUIS, U. S. A.

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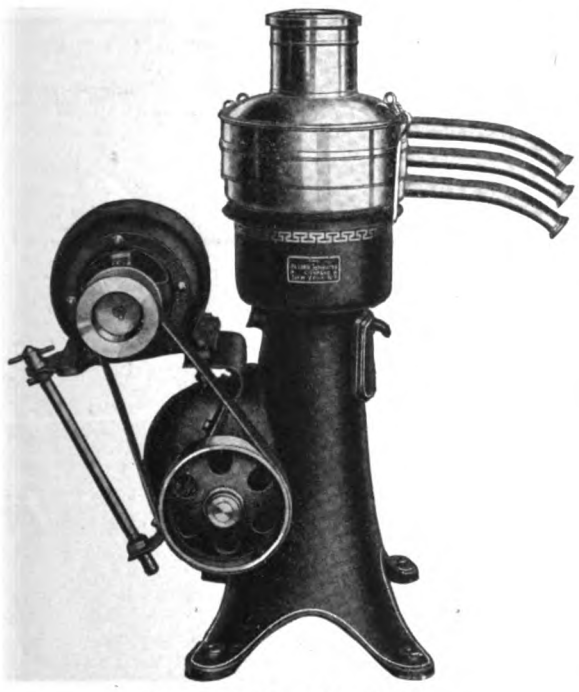
The DE LAVAL Centrifugal Oil Purification Process Maintains all the lubricating qualities of your oil—indefinitely

You test all oil very carefully before buying it—you insist that it have a certain viscosity and a certain flash point, among other specifications.

What good does all this precaution do you if you keep on using the oil after it has become foul? It quickly accumulates carbon, grit, water and other impurities, always getting worse until you are afraid to use it any longer and pump it overboard—a total loss.



De Laval Centrifugal Oil Purifier (Motor-Driven)

Thus most of the time your oil is used it does not have the lubricating qualities for which you bought it and paid good money.

Here is the remedy: Install the De Laval Centrifugal Oil Purification Process, which instantly takes the carbon and other impurities out of the oil—making it as good as new.

It will cut down your oil bill very materially and also your oil storing space—in addition to maintaining a supply of uniformly clean oil in your system.

The De Laval Process is simple and effective, uses little space and power, and is not affected by the motion of the ship.

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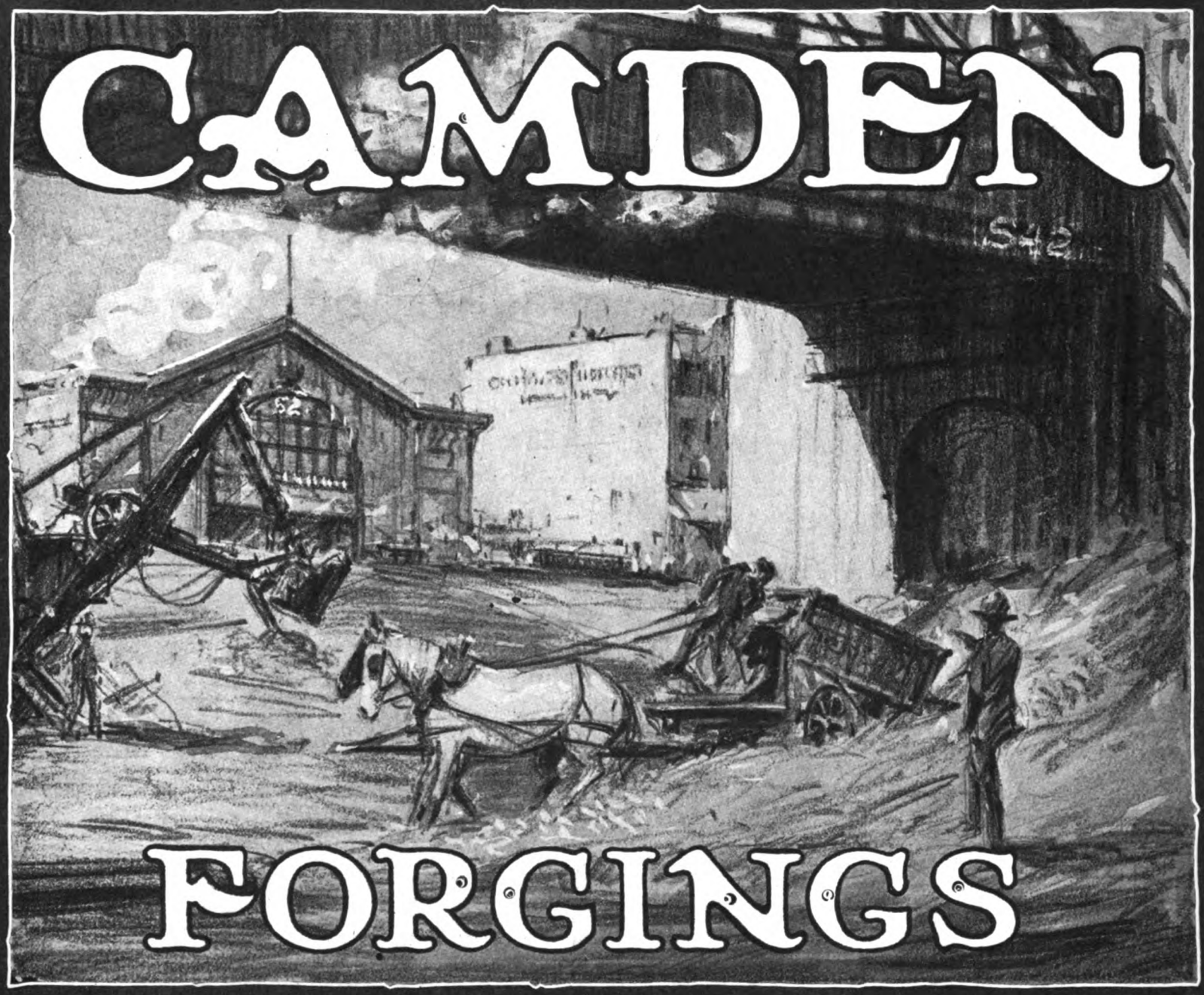

FORGINGS

Come On!

Clear the way to the Docks. Are we sure that there will be Ships alongside the Docks to take our goods?

Let's untrammel the Shipbuilder and Ship Operator, they have shown their ability in building and operating ships.

Come On! · Men and Women, living working and voting between the Alleg-heny and Rocky Mountains, Come On! We're all part of a Maritime Nation.

CAMDEN FORGE CO.

CAMDEN, N.J., U.S.A.

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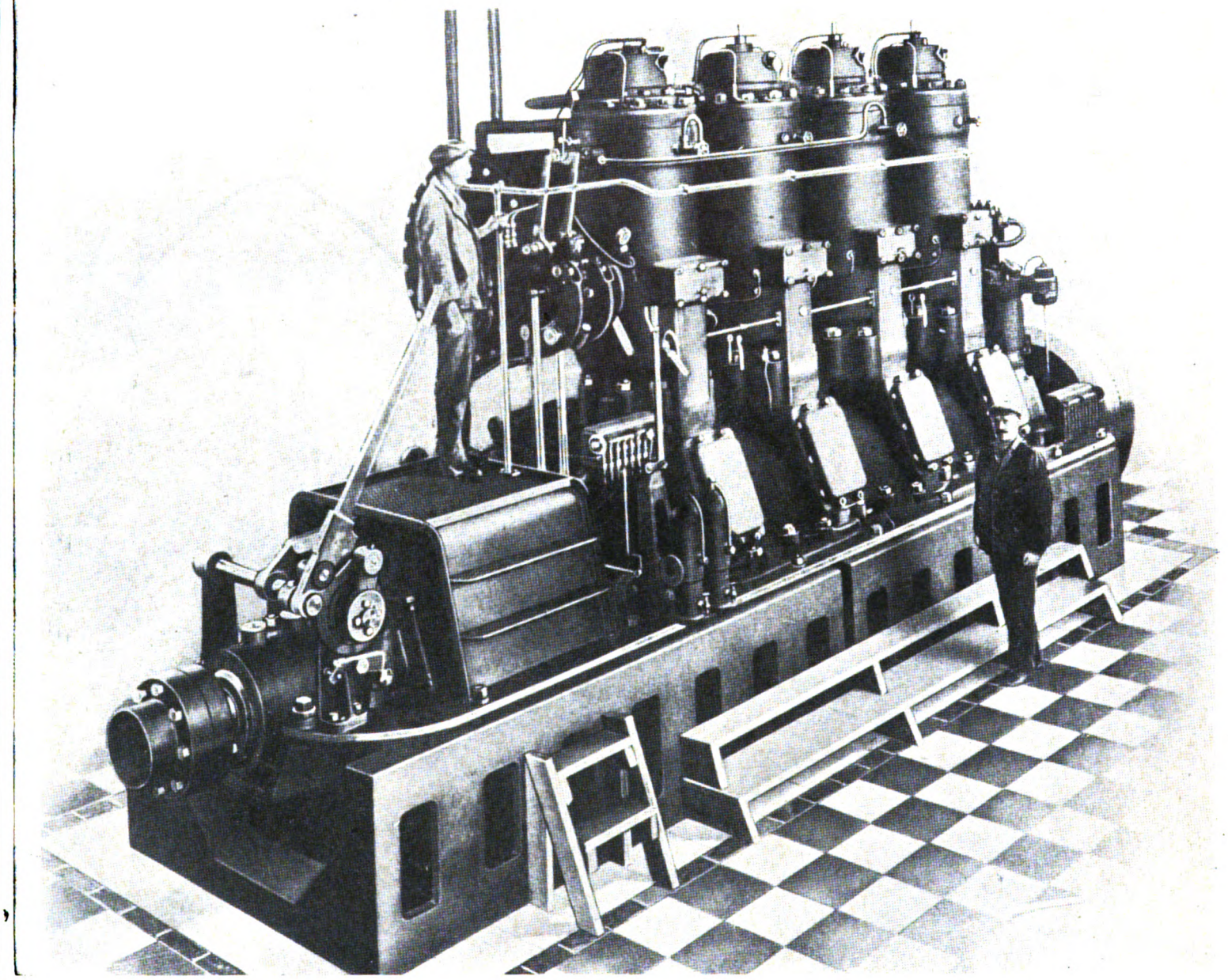
BOLINDER'S

Over 13,500 Engines Now in Service. 650,000 B. H. P. in Use in All Parts of the World



500 B. H. P. (500 to 600 B. H. P.) Model "M11." 160 Revolutions per M. (without water injection). (Guaranteed for continuous overload of 10%)

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THE ENGINE THAT IS NOT A SEMI-DIESEL
THE ENGINE THAT IS THE BOLINDER
THE STANDARD FOR SURFACE-IGNITION FUEL OIL ENGINES

HENRY LUND & COMPANY

MARINE BUILDING, SAN FRANCISCO, CALIFORNIA

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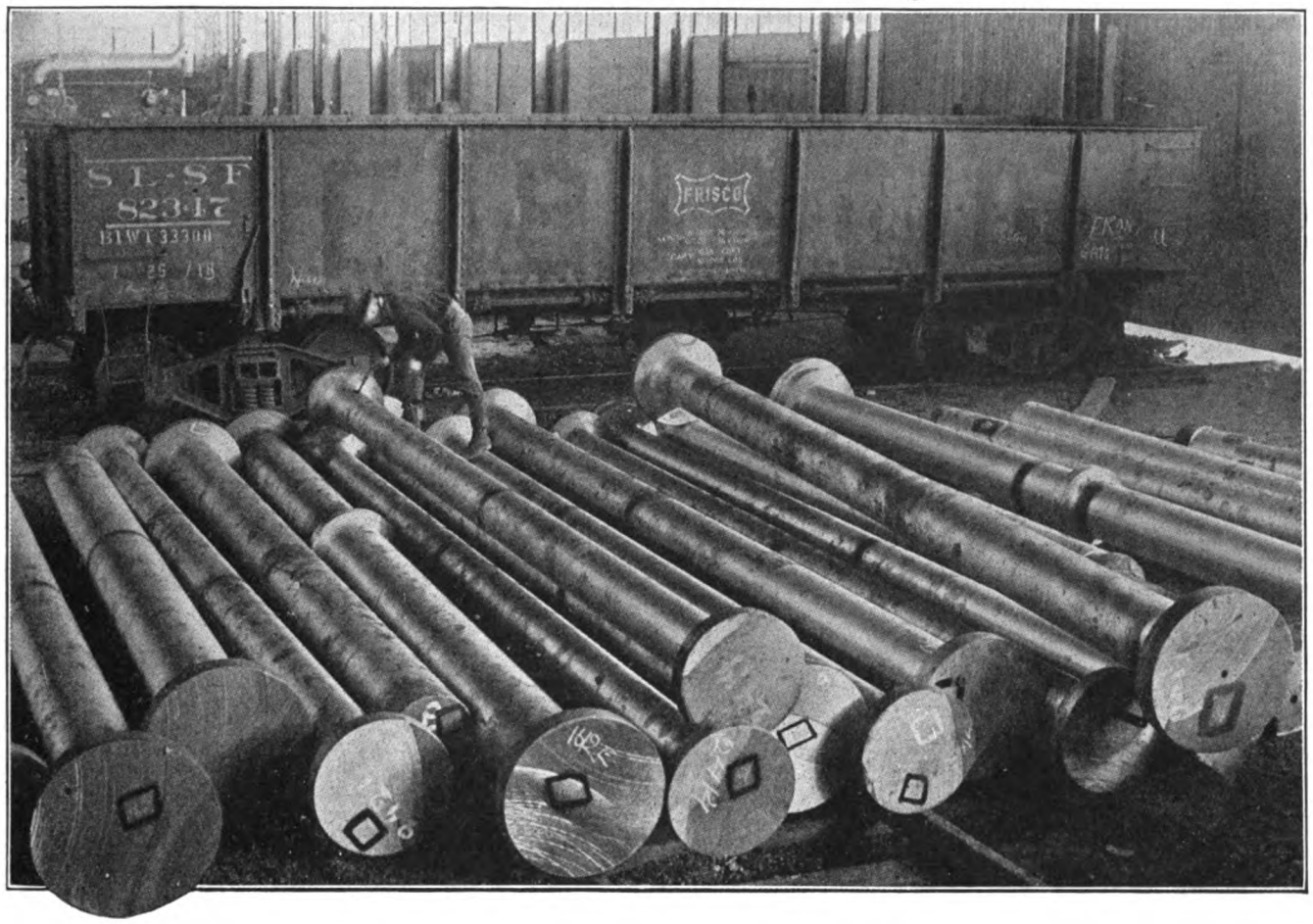

TWO PROBLEMS

are here presented. For the mathematically inclined, how many car loads are there in this pile of

CAMDEN FORGINGS?

For the psychologically inclined, how many astute business men will be sufficiently impressed by this display to order our name placed on the list of those to receive their forging inquiries?

BUYERS' MEMO.

- High and Low Carbon Bars
- Press Columns and Rams
- Pull Back Cylinders
- Water Cylinders
- Valve Bodies
- Plungers
- Weldless Steel Rings
- Lathe Spindles, solid and hollow bored
- Long Feed Screws
- Power Press Crank Shafts
- Rudder Arms
- Rudder Stocks
- Cam Shafts
- Eccentric Shafts
- Crusher Shafts
- Gear and Pinion Blanks
- Locomotive: Side and Main Rods; Crank Pins; Axles; Rod Straps; Guides; Parts of frame both in iron and steel
- Hammered Iron Bars for locomotive repairs
- Marine Shaft
- Marine Connecting and Eccentric Rods
- Rolls: Bending; Feed; Straightening; **Embossing**
- Large Wrenches
- Saw Arbors
- Steam Engine Forgings
- Pump Crank Shafts
- Pump Connecting Rods
- Large Nuts
- Turbine Shafts
- Mill Shafting
- Trolley Car Axles
- Electric Motor Axles
- Any forging to your print, and specifications, in either iron or steel.

CAMDEN FORGE CO.
CAMDEN, N.J., U.S.A.

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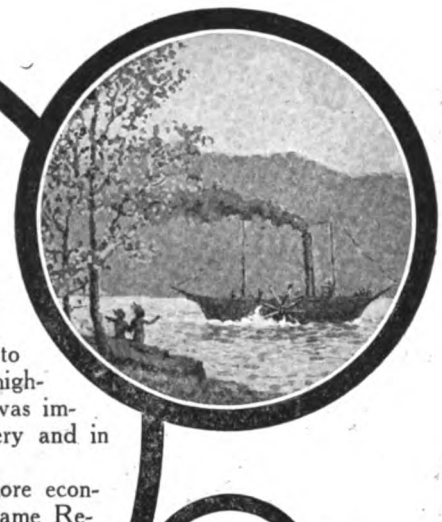
Westinghouse
Marine Equipment

The launching of the S.S. Newburgh on Sept. 2, 1918, in the historic waters of the Hudson, recalls to mind the Clermont—the first steam-propelled vessel to make a successful voyage. Although Robert Fulton left no details of the construction or of the cost of this first steamboat, we picture it a small, wooden craft propelled by a beam engine with exposed paddle wheels. The same ideals that inspired Fulton, led his successors to take his contribution in its crude form and bring it to its present high state of efficiency.

When Westinghouse spent hundreds of thousands of dollars to perfect a reduction gear that would permit the employment of high-speed turbines and low-speed propellers, the inspiring ideal was improved economy, in fuel consumption, in weight of machinery and in engine room space.

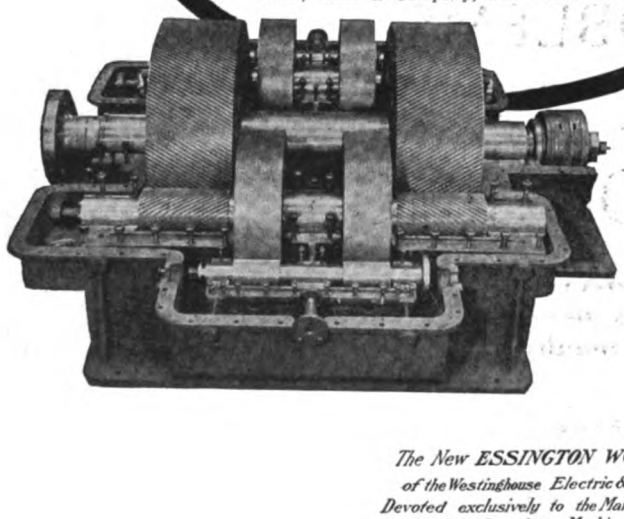
By furnishing the means for greater cargo capacity, and more economical operating costs, the Westinghouse Flexible-Pinion-Frame Reduction Gear, such as is installed on the S.S. Newburgh, contributes materially toward placing the new American Merchant Marine on a competitive basis.



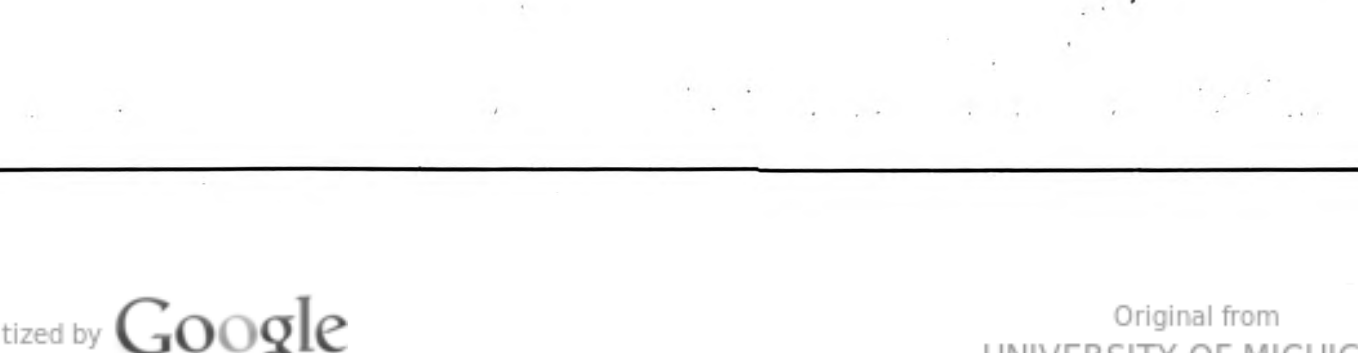
WESTINGHOUSE ELECTRIC & MANUFACTURING CO.
MACHINE WORKS

Successors to the Westinghouse Machine Co., Washington, D. C.
East Pittsburgh, Pa.

Hunt, Mirk & Company, San Francisco—Seattle



The New **ESSINGTON WORKS**
of the Westinghouse Electric & Mfg. Co.
Devoted exclusively to the Manufacture
of Marine Propulsion Machinery



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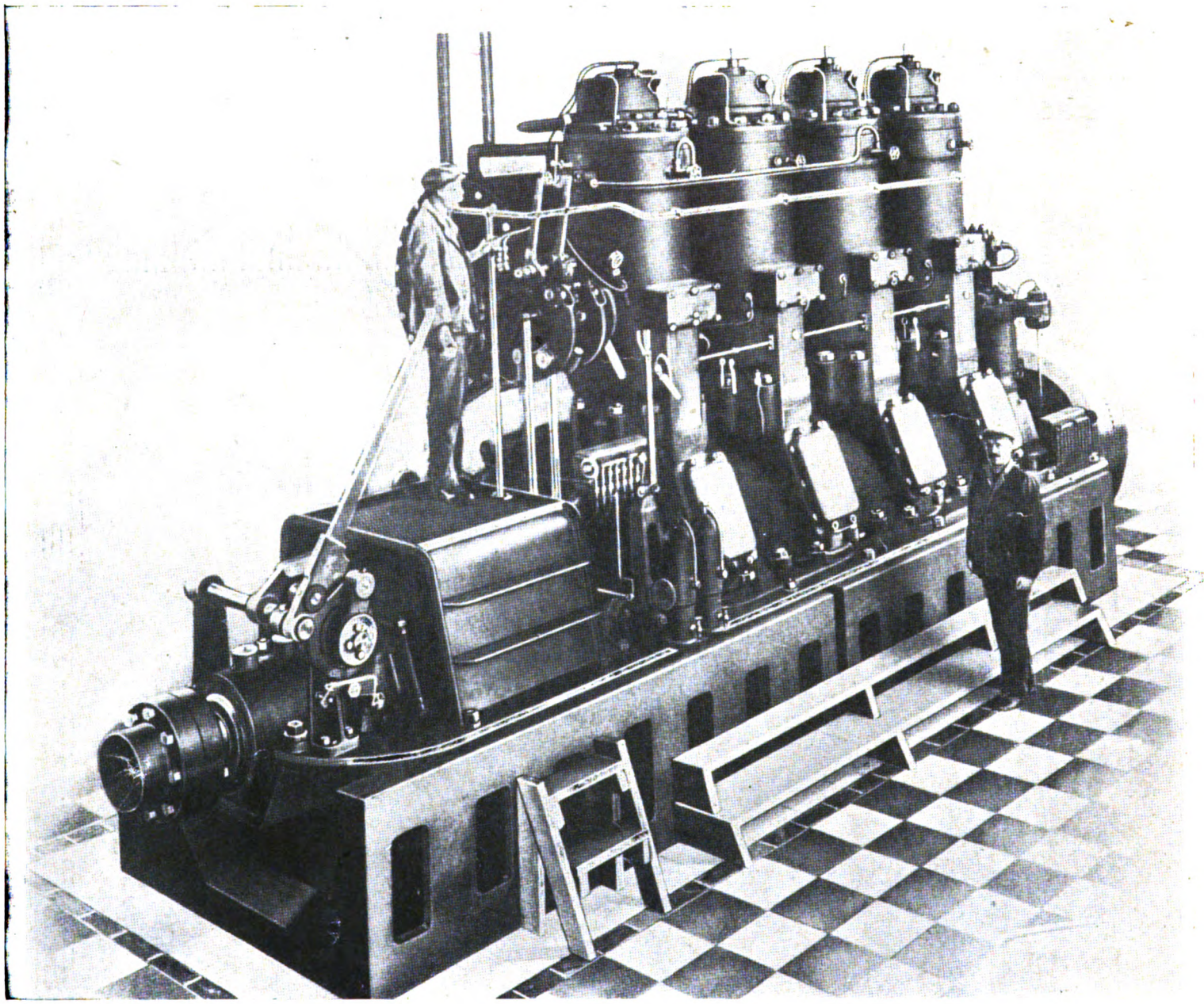

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MARINE BUILDING, SAN FRANCISCO, CALIFORNIA

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MIDWEST MARINE POWER

THE real test of the efficiency of a marine power unit is found in the charts and records of the Captain of the vessel. It is spelled not only by ultimate economy of operation, but by the many days the vessel spends upon the water as against the few days required in dock for repairs and overhauling.

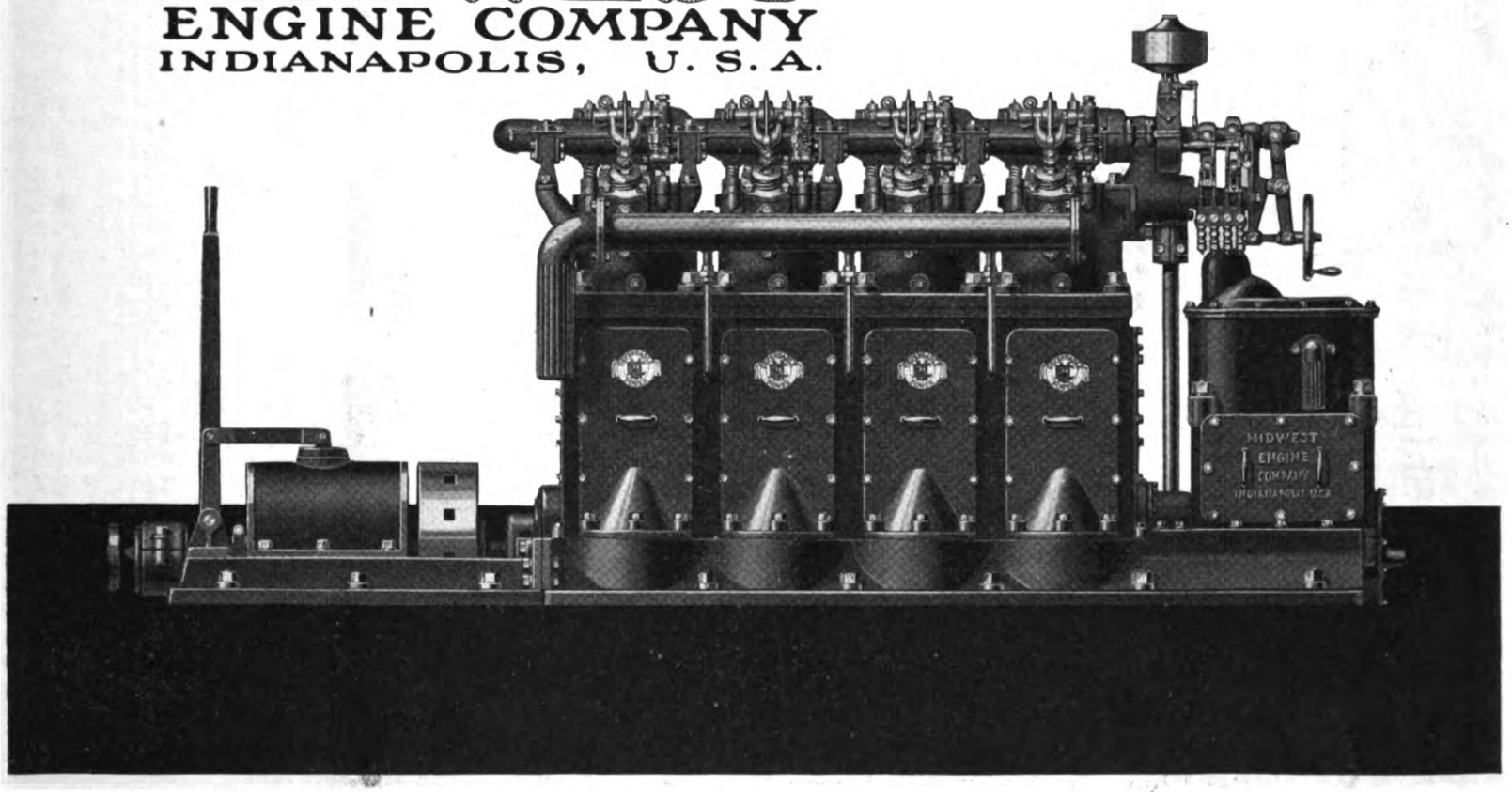
Midwest marine units, such as the four-cylinder reverse type Marine Diesel shown here, are built to stand up under the strain of long service. They are rugged, enduring, efficient, economical.

Our engineering experts will gladly give you the benefit of their long and wide experience in handling problems of marine power in figuring on the best and most economical installation for your requirements.

DEPENDABLE MP POWER

Midwest Marine Products
Steam Turbines,
Diesels,
Internal Combustion Engines,
Pumps
and Auxiliaries

MIDWEST
ENGINE COMPANY
INDIANAPOLIS, U. S. A.



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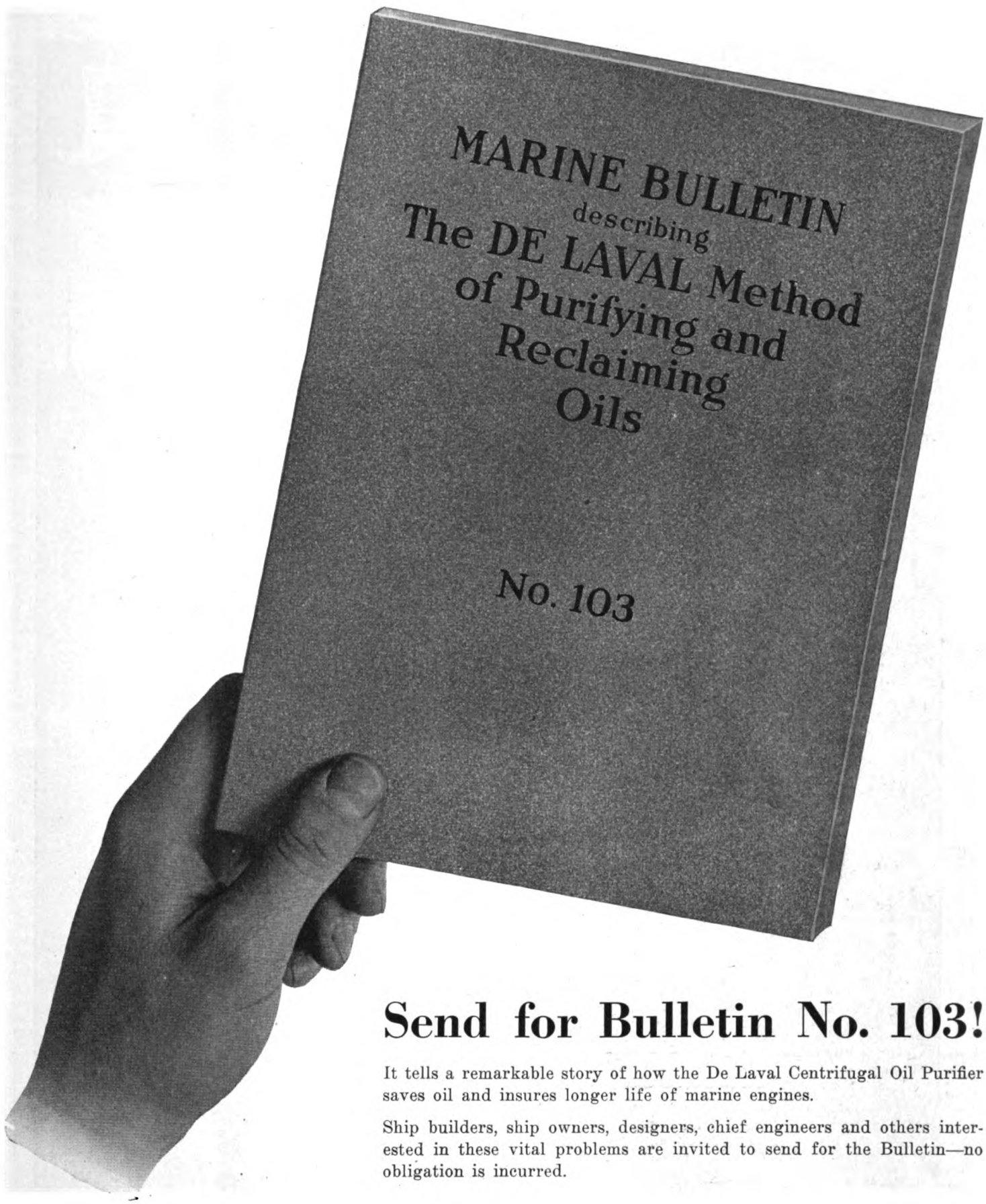

Send for Bulletin No. 103!

It tells a remarkable story of how the De Laval Centrifugal Oil Purifier saves oil and insures longer life of marine engines.

Ship builders, ship owners, designers, chief engineers and others interested in these vital problems are invited to send for the Bulletin—no obligation is incurred.

THE DE LAVAL SEPARATOR CO.

165 Broadway, New York **29 East Madison Street, Chicago**

World's Largest Makers of Centrifugal Machinery

Manufacturers' Selling Agents

De Laval Steam Turbine Co.
TRENTON, N. J.

De Laval Dairy Supply Co.
SAN FRANCISCO

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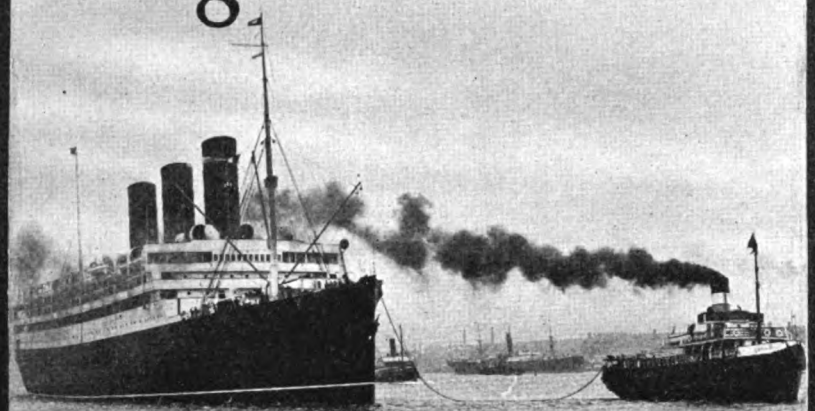
We make forgings for the Ship and Engine Builder



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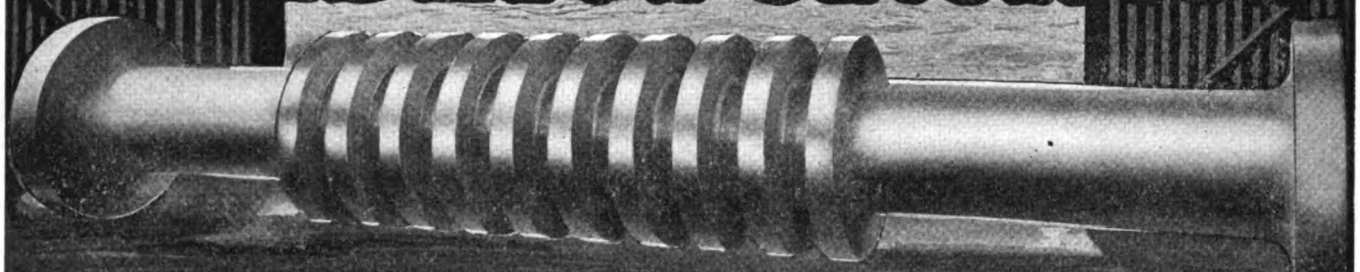

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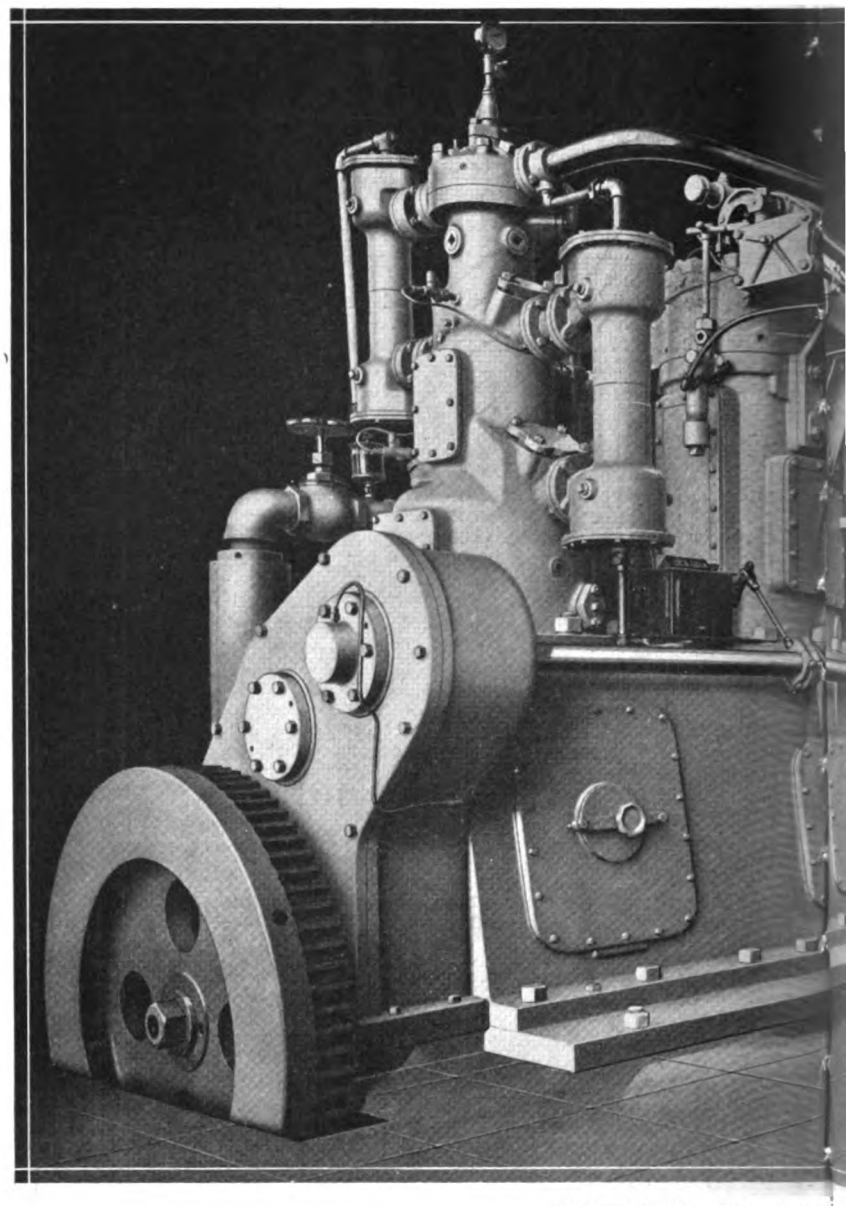

WINTON EIGHT CYLINDER

A BETTER ENGINE, designed better, built better, runs better.

Proven out in actual service to be more economical, more efficient, and more dependable.

Your motorships should be Winton equipped.

WINTON ENGINE WORKS

***Seattle Representative*---H. W. STA**

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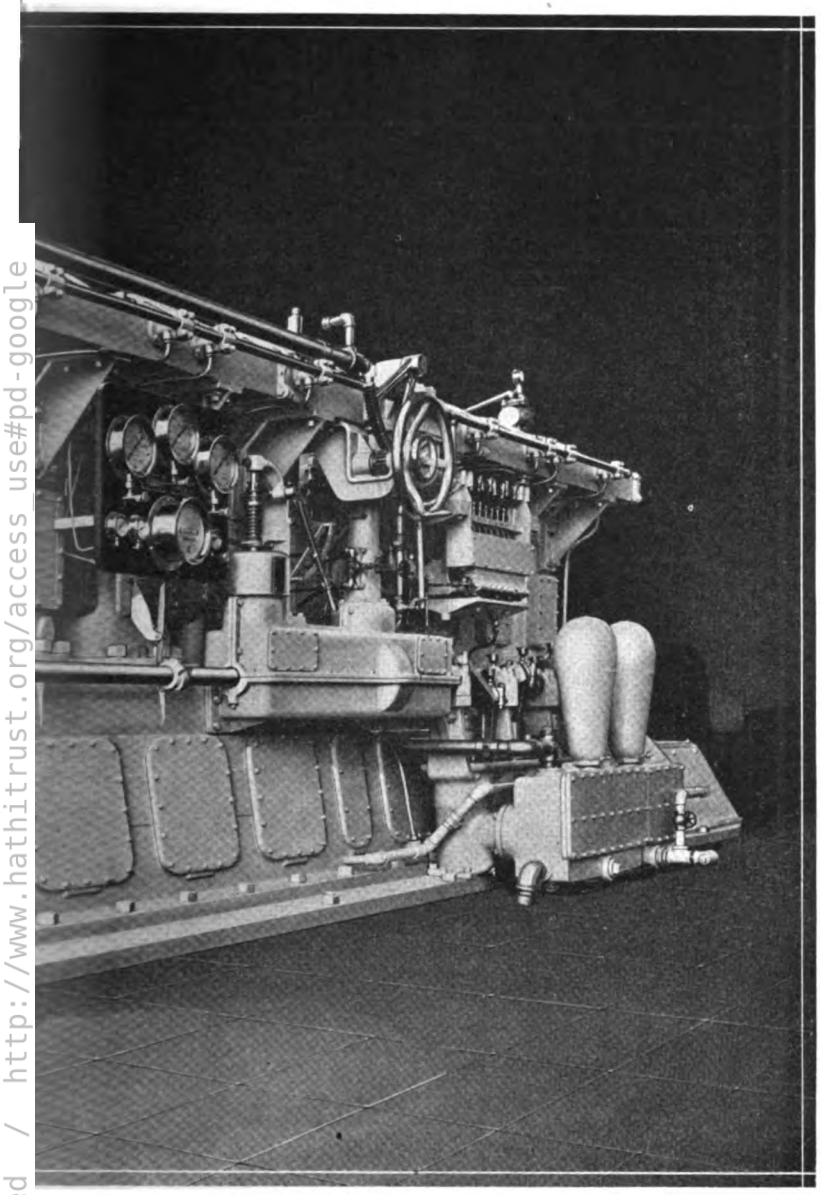
Engines



LL DIESEL OIL ENGINE

Our Engineering Department is at your disposal to co-operate with you in working out the power plan requirements of ships ranging from 500 to 10,000 tons.

Complete specifications and power curves promptly supplied upon receipt of details of your requirements.

CLEVELAND, OHIO, U.S.A.

Γ, SUNSET ENGINE COMPANY

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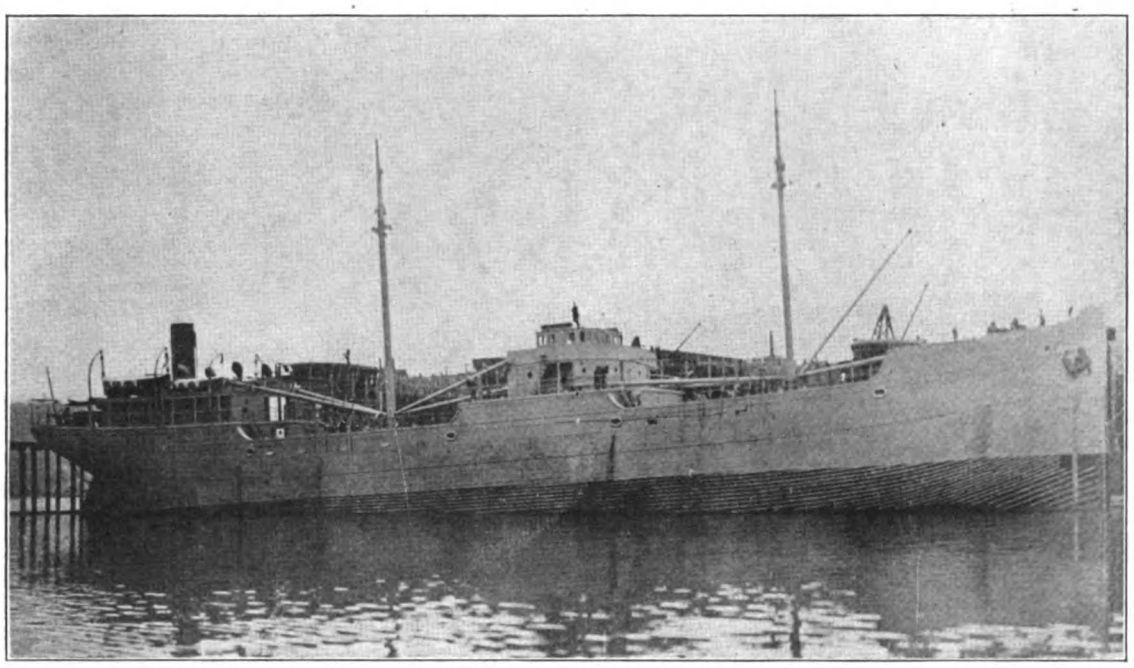
McINTOSH & SEYMOUR

HEAVY DUTY
DIESEL TYPE MARINE ENGINES

A Modern Motorship Requires a Smaller Crew Than a Steamship and Uses Very Much Less Fuel Which Give Lower Operating Cost and More Capacity for Cargo



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390 I.H.P.
640 I.H.P.
960 I.H.P.
1300 I.H.P.
1550 I.H.P.
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All Four Cycle Six Cylinder and Directly Reversible

MOTORSHIP "CETHANA," one of nine sister ships of the AUSTRALIAN COMMONWEALTH GOVERNMENT LINE, equipped with PAIRS OF 640 I.H.P. McINTOSH & SEYMOUR DIESEL TYPE MARINE ENGINES. The first four of these vessels are now in regular service between this country and Australia.

Vessel owners are cordially invited to inspect our facilities.

McINTOSH & SEYMOUR CORPORATION

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AUBURN, N. Y.

149 Broadway
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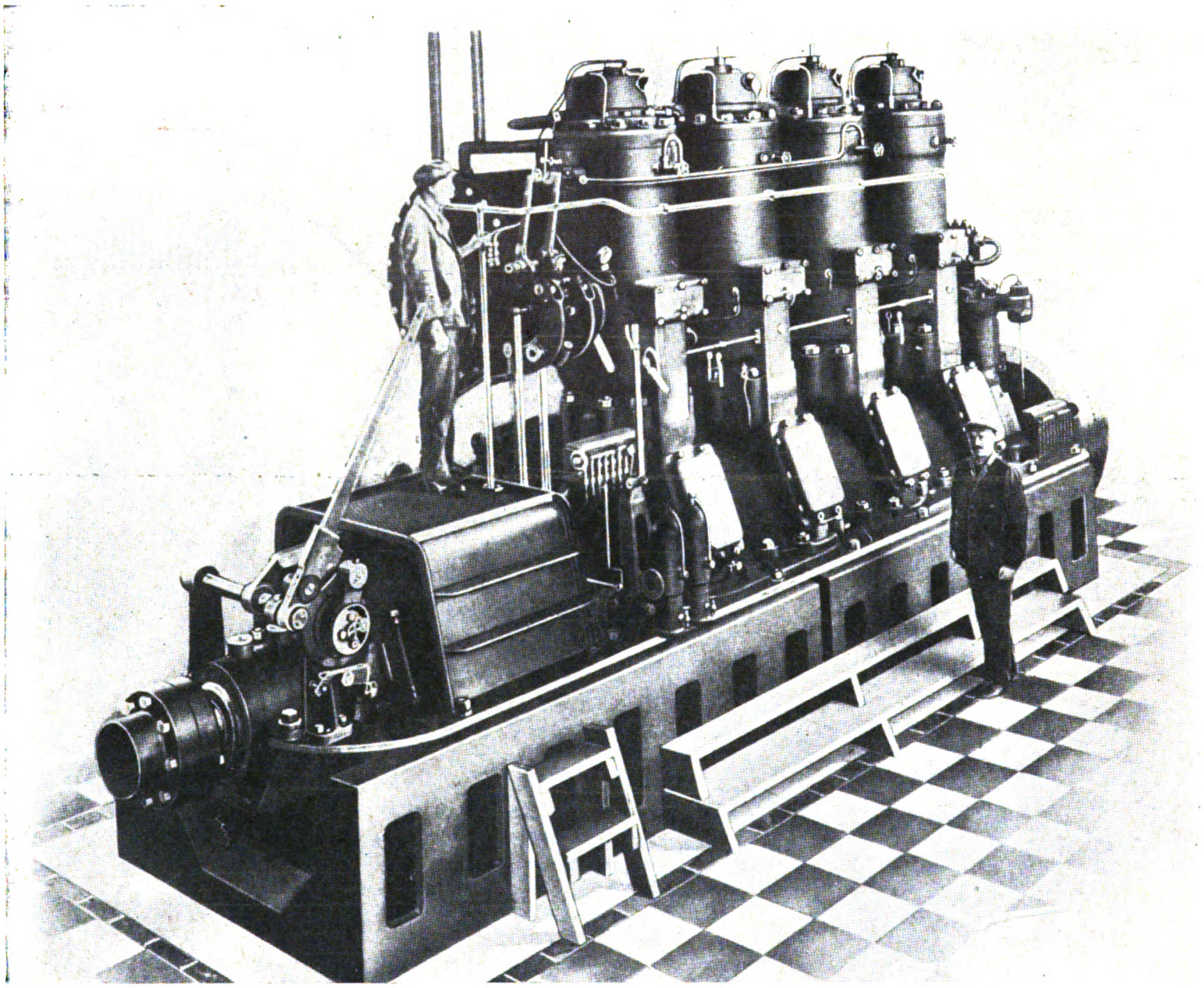
BOLINDER'S

Over 13,500 Engines Now in Service. 650,000 B. H. P. in Use in All Parts of the World



500 B. H. P. (500 to 600 B. H. P.) Model "M11." 160 Revolutions per M. (without water injection). (Guaranteed for continuous overload of 10%)

The BOLINDER

THE ENGINE THAT IS NOT A DIESEL
THE ENGINE THAT IS NOT A SEMI-DIESEL
THE ENGINE THAT IS THE BOLINDER
THE STANDARD FOR SURFACE-IGNITION FUEL OIL ENGINES

HENRY LUND & COMPANY

MARINE BUILDING, SAN FRANCISCO, CALIFORNIA

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VICKERS

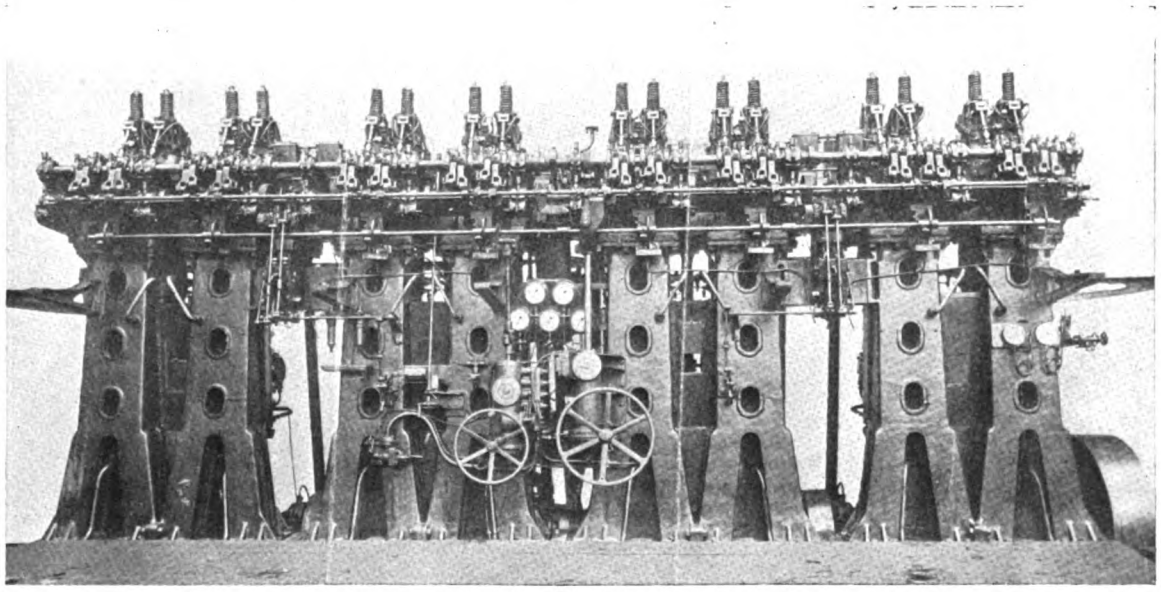
Solid Injection Marine Oil Engines

ALL THE ADVANTAGES of the Diesel Engine without the danger and complication of the Blast Air Compressor.

ALL THE ADVANTAGES of the Surface Ignition Engine without delay in starting, troublesome lamps, or hot bulbs.

LOW FUEL CONSUMPTION—down to 0.38 lbs. per brake horse power.
(This corresponds to 0.28 lbs. per indicated horse power in the ordinary Air Injection Diesel Engine).

Vickers Limited, who have been in the High Power Marine Oil Engine Industry since its early days, and are the Designers and Licensors of the British Submarine Engines, have not fitted an Air Compressor to their Marine Diesel Engines since 1911. Nearly 400,000 B.H.P. in large units constructed.



A REMARKABLE RECORD.

The above photograph shows one of six similar solid injection engines supplied during the War. It develops 750 B.H.P. on Texas fuel at 150 R.P.M. The ship was run on service so urgent that for 18 MONTHS NO BEARING OR CYLINDER WAS OPENED, and apart from occasional grinding-in of the spray valves, THE ONLY VALVE OPENED WAS ONE EXHAUST VALVE for easing of the spindle. Yet the engines were "running like clockwork" when the failure of the Auxiliary STEAM plant led to the ship being laid up for overhaul. Vickers' merchant ship engines are improvements on these.

VICKERS LIMITED

HEAD OFFICE, BROADWAY, LONDON, S. W. I.

MARINE ENGINE WORKS, BARROW-IN-FURNESS, ENGLAND

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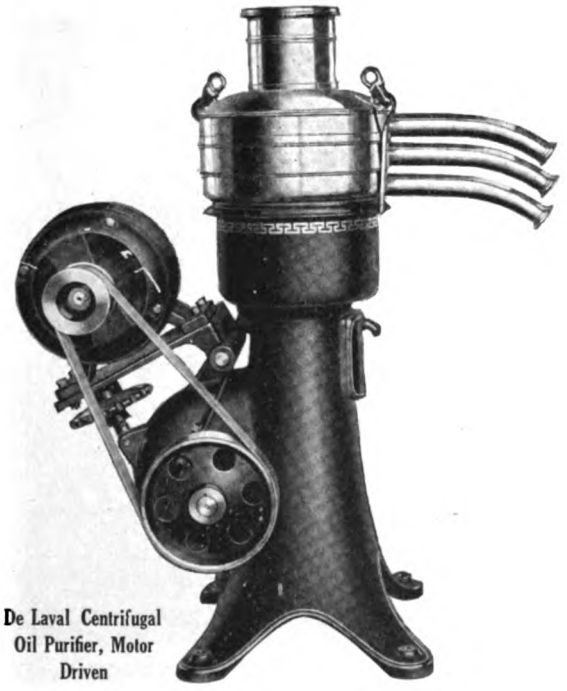
The use of the DE LAVAL Oil Purifier eliminates the pitting of cylinder walls

The use of low-priced, high-sulphur fuel oils in Diesel and Semi-Diesel engines has its main drawback in that sulphuric acid is formed, which rapidly attacks and pits the walls of the cylinders and cylinder heads.

These high sulphur oils invariably contain a certain amount of water. During the combustion of the fuel charge the oxidation of the sulphur forms sulphur dioxide (SO_2), and this sulphur dioxide unites with the water, forming sulphurous acid (H_2SO_3). This acid unites with oxygen, forming sulphuric acid (H_2SO_4).

The De Laval Method of Purification dehydrates this oil, thus eliminating any possibility of sulphuric acid being formed. It is therefore a necessity wherever high-sulphur fuel oils are used.



De Laval Centrifugal Oil Purifier, Motor Driven

Please ask nearest office for further information on centrifugal dehydration of high-sulphur oils. The knowledge and experience of our experimental department are at your service.

The De Laval Separator Co.

165 Broadway, New York 29 E. Madison Street, Chicago

World's Largest Makers of Centrifugal Machinery

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De Laval Dairy Supply Co.
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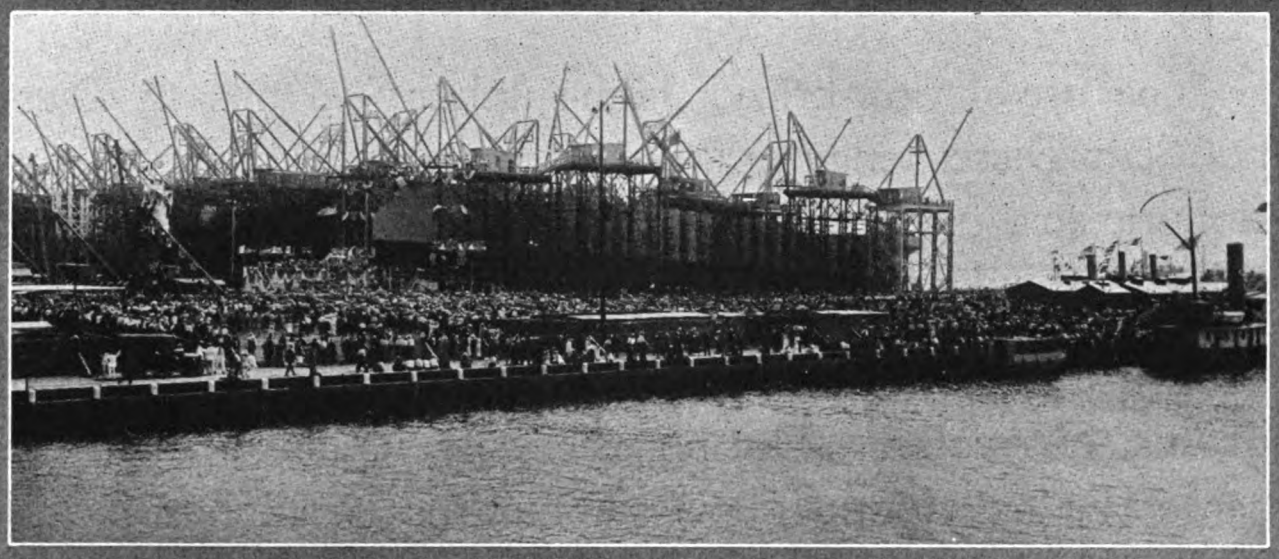

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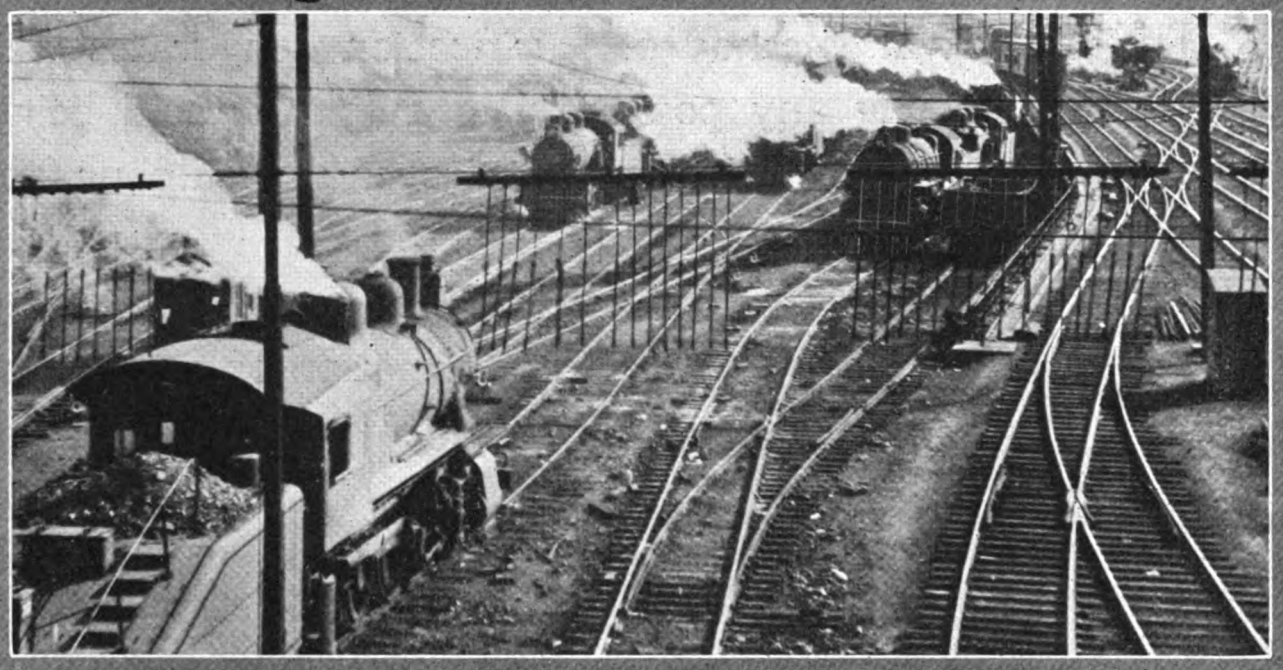
Transportation Land or Sea



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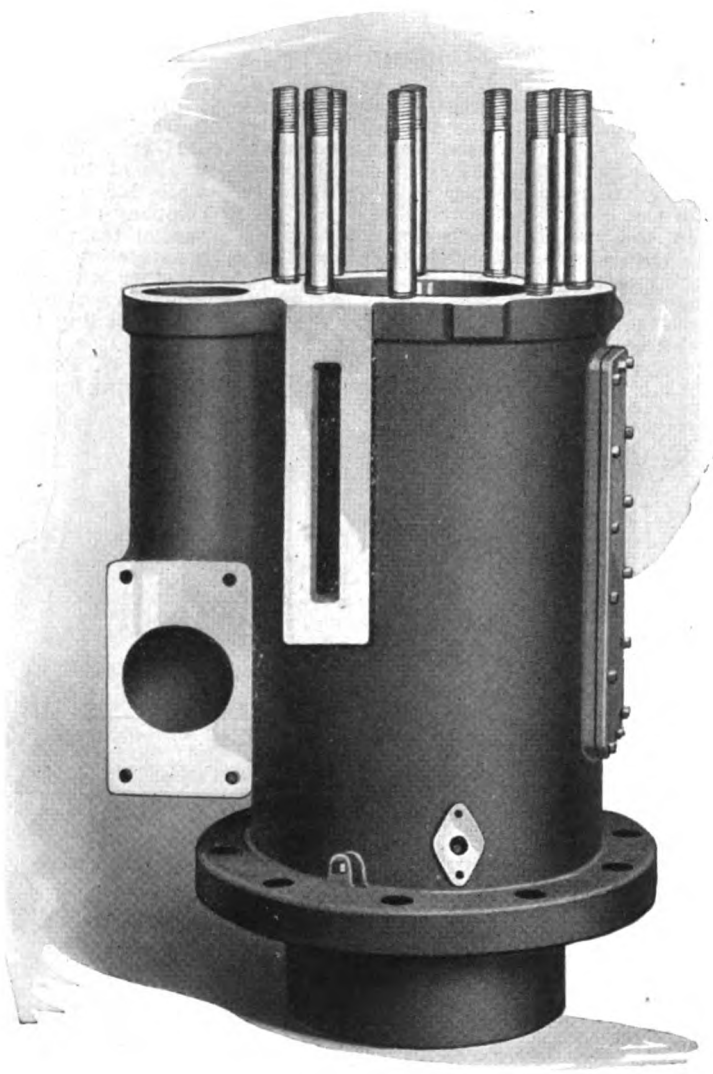

WINTON DIESEL OIL N
Winton Products. Th
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The cylinder and cylinder l
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Efficient, dependable service will be
Winton Diesel Oil Engines.

Our Engineering Department will g
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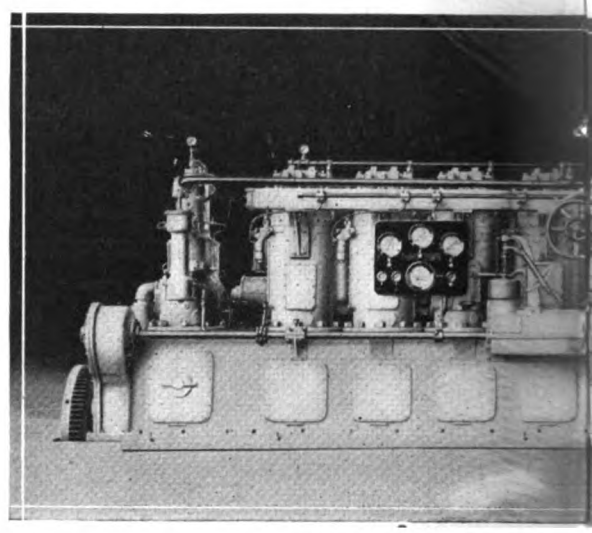

WINTON EIGHT CYLINDER

WINTON ENGINE WORKS

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Engines

NES are characteristically
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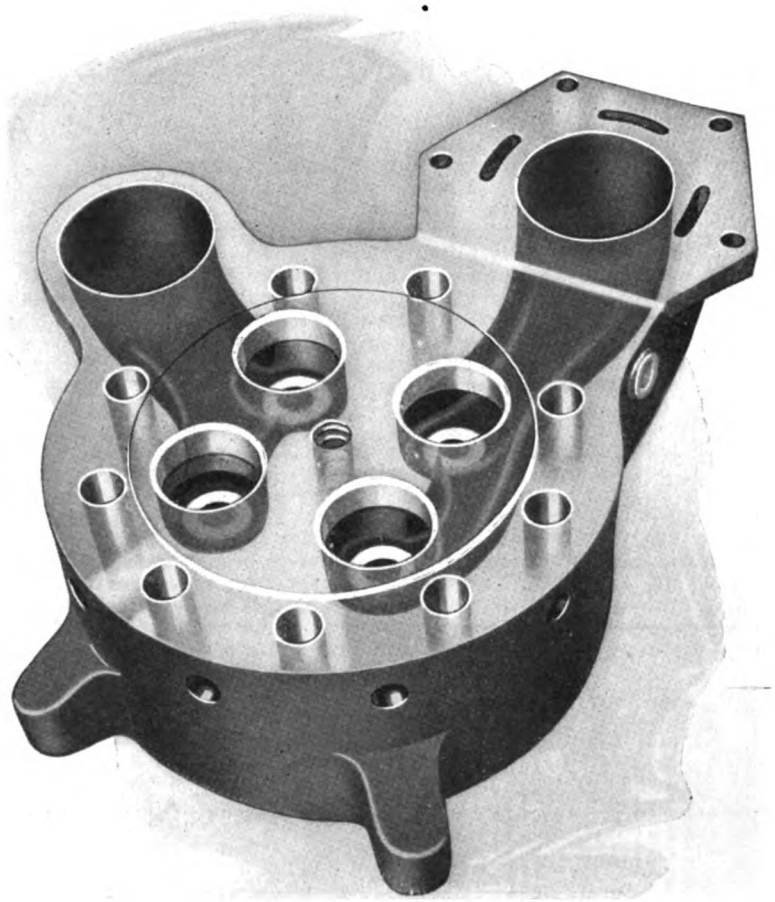

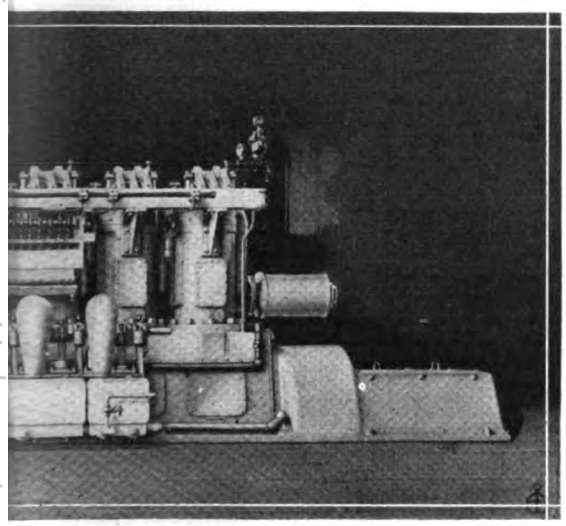

LL DIESEL OIL ENGINE

CLEVELAND, OHIO, U.S.A.

T, SUNSET ENGINE COMPANY

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FOR PROPELLING COMMERCIAL VESSELS OF ALL TYPES

AND FOR

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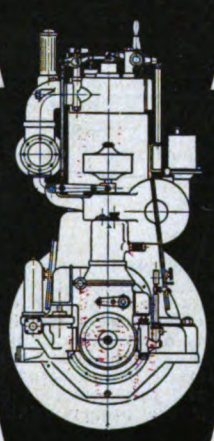
PITTSBURGH HEAVY DUTY OIL ENGINE



THEY ARE HIGHLY DESIRABLE AS POWER FOR LIGHTING-SETS, ETC., IN SHIPS AND ON LAND

WE ARE READY TO ARRANGE FOR A LIMITED NUMBER OF AGENCIES IN AMERICA AND ABROAD, AND WILL BE PLEASED TO RECEIVE APPLICATIONS FROM RESPONSIBLE FIRMS

PITTSBURGH FILTER & ENGINEERING CO.

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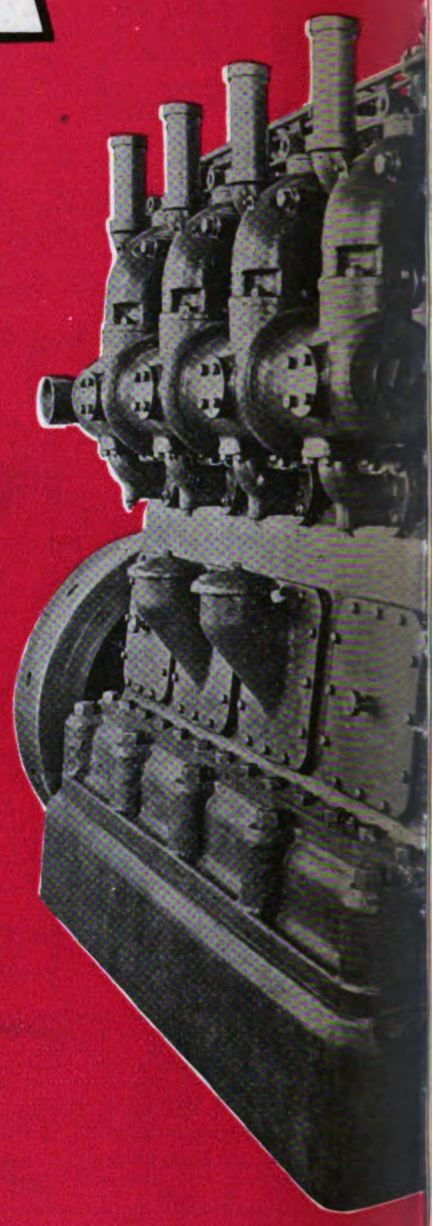

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THE
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WORKS
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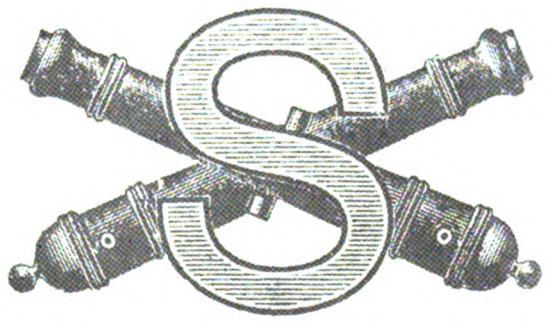
FRANCE



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American Office:
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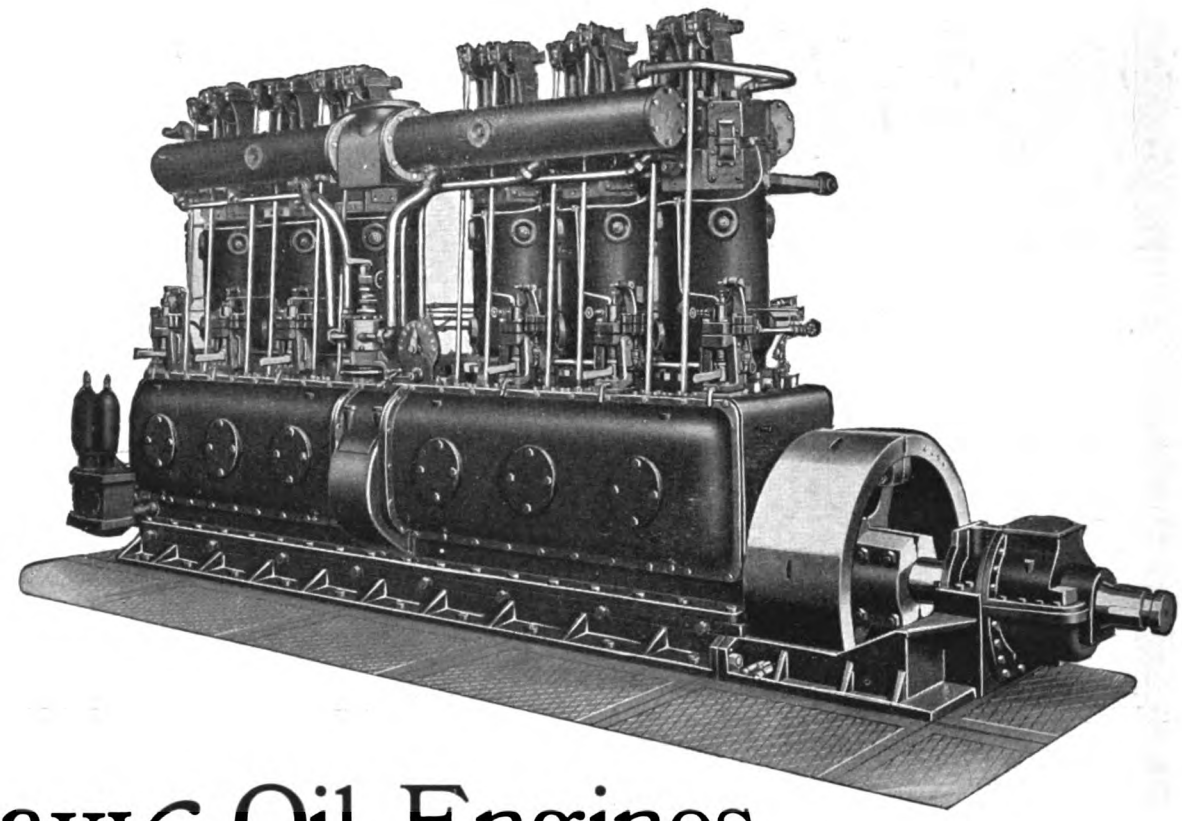

Heavy Oil Engines of the Highest Economy

The highest development of the American Oil Engine.

It operates on the four-stroke cycle with low cylinder compression and direct injection of fuel without the use of compressed air.

Ignition—By temperature of compression; cylinders and heads entirely water jacketed. (No hot bulb).

A High Economy Oil Engine As Simple and Dependable As the Gas Engine

The Company is prepared to accept orders for early delivery of the following sizes:

Direct Reversible Marine Engines from 200 to 600 shaft horse power.

Vertical Stationary Engines from 105 to 500 brake horse power.

Inquiries are solicited

INGERSOLL-RAND COMPANY

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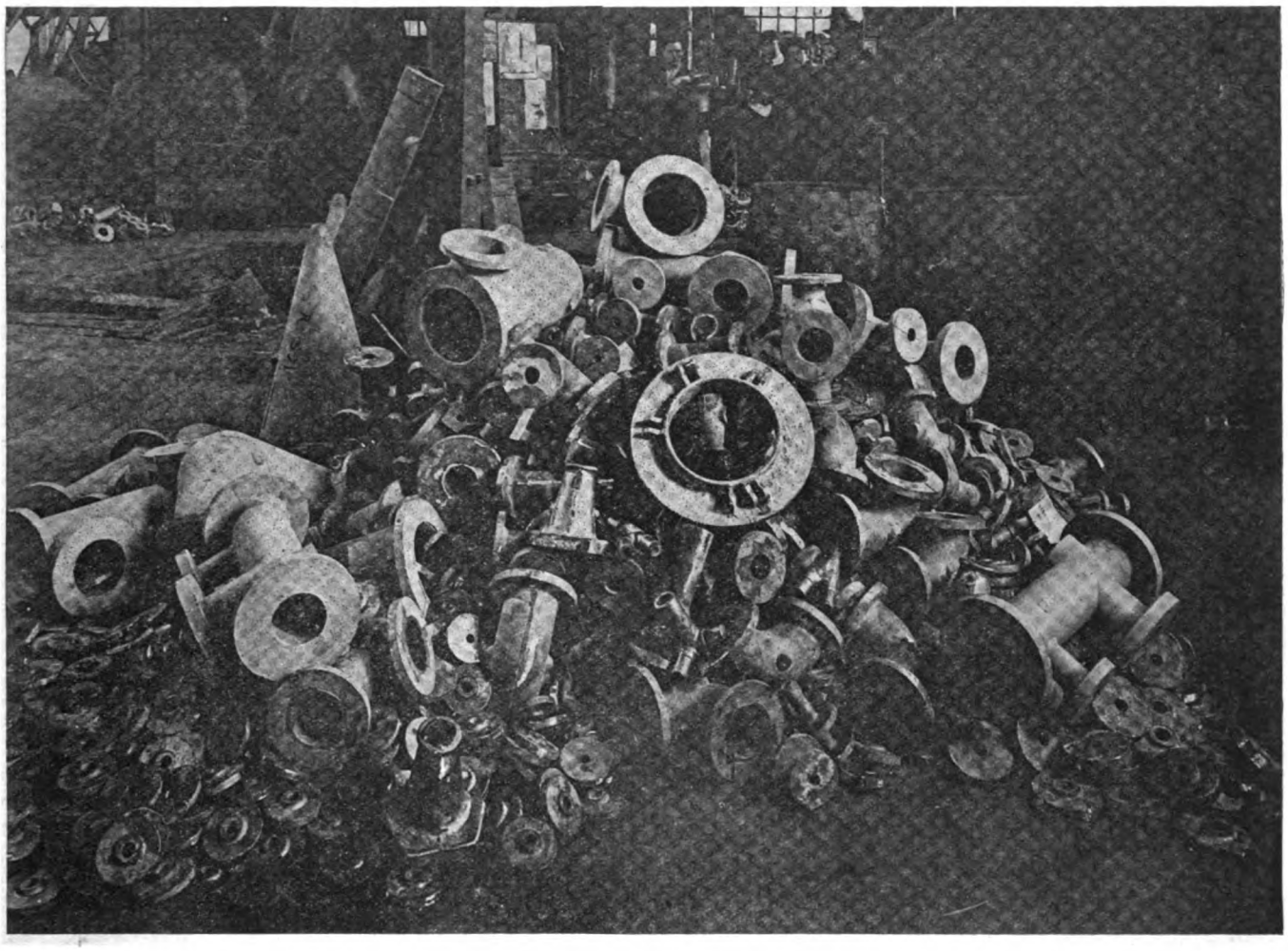
BRONZE CASTINGS . .	1,000,000 LBS. PER MONTH
STEEL CASTINGS . . .	2,000,000 LBS. PER MONTH
IRON CASTINGS . . .	3,000,000 LBS. PER MONTH



DAILY SHIPMENT OF BRONZE MARINE CASTINGS FROM CRAMP'S BRASS FOUNDRY TO ONE CUSTOMER

AMONG THE CASTINGS SHOWN ABOVE ARE—

PROPELLER NUT COVERING CAPS	COMPOSITION	G	(GUN METAL)
STERN TUBE BUSHINGS	"	H	(BEARING METAL)
DECK SCUTTLE FRAMES	"	MN-C	(MANGANESE BRONZE)
STEAM PIPE CONNECTIONS	"	M	(STEAM METAL)

THE WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING COMPANY

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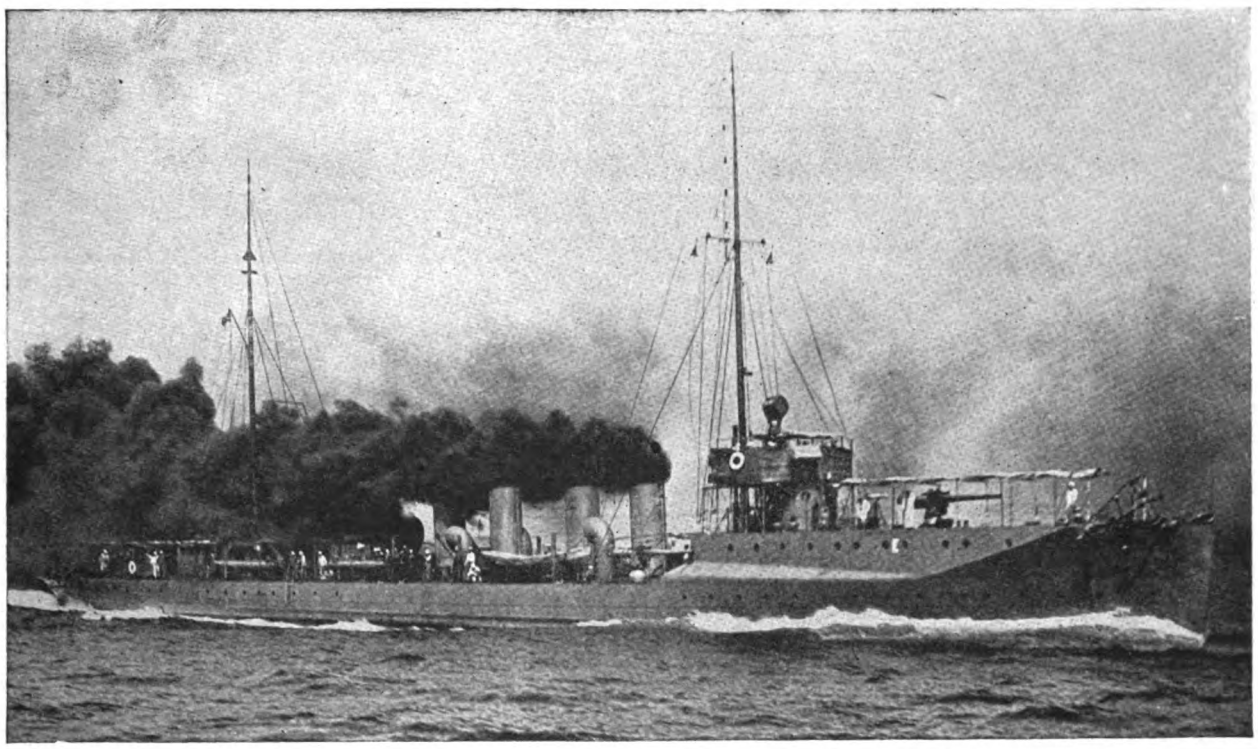

© E. Muller, Jr., N. Y.

De Laval Oil Purifiers on U. S. Destroyers

The U. S. Navy, after the most thorough laboratory experiments and months of actual sea-going tests, has ordered that every destroyer being built be equipped with a De Laval Oil Purifier.

While the saving in oil is very important, the main reason for the Government order is that the De Laval Oil Purifier removes water, metal particles and other impurities from the oiling system—thereby maintaining the original efficiency and safety of the engines and gears.

Every ship, whether driven by steam or combustion engine, should be equipped with the De Laval Oil Purifier, as it is the most effective means of removing water, dirt, metallic particles and all other impurities from lubricating oil—restoring the oil to its original usefulness.

Write for Marine Bulletin No. 103 and also Bulletin No. 102, explaining the Reclamation of Crank Case Oils.

THE DE LAVAL SEPARATOR COMPANY

165 Broadway
New York

29 East Madison Street
Chicago

World's Largest Makers of Centrifugal Machinery

MANUFACTURERS' SELLING AGENTS
De Laval Dairy Supply Co., San Francisco, Cal.

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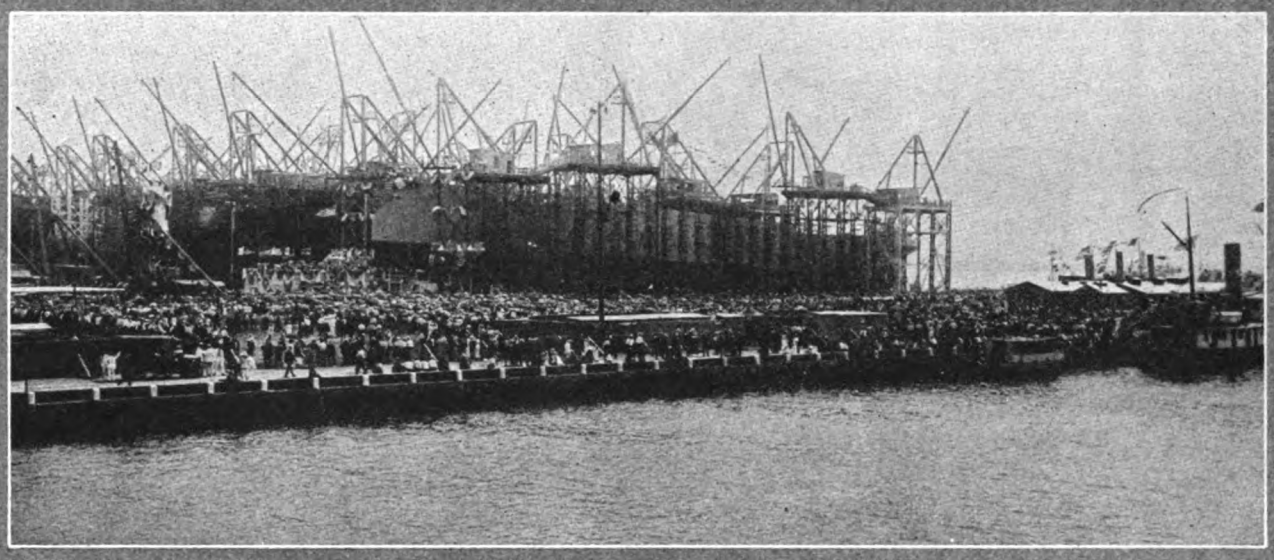
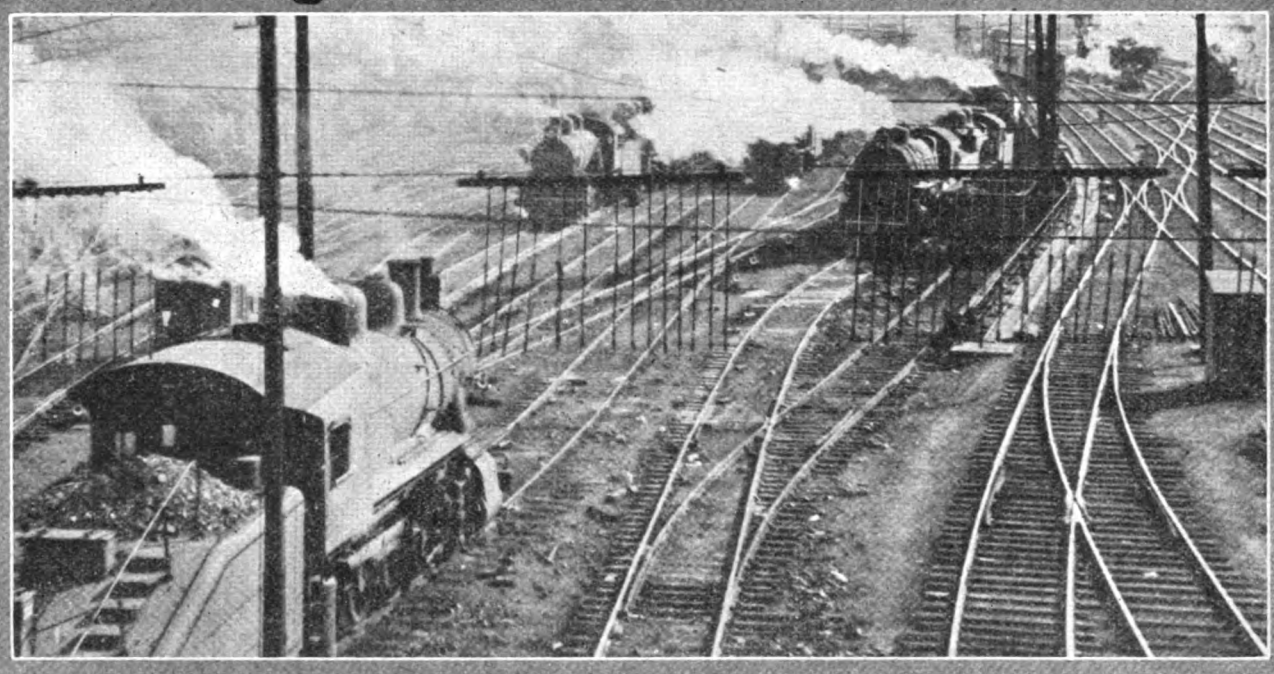


CAMDEN FORGINGS
Transportation Land or Sea



CAMDEN FORGE CO.
CAMDEN, N.J., U.S.A.

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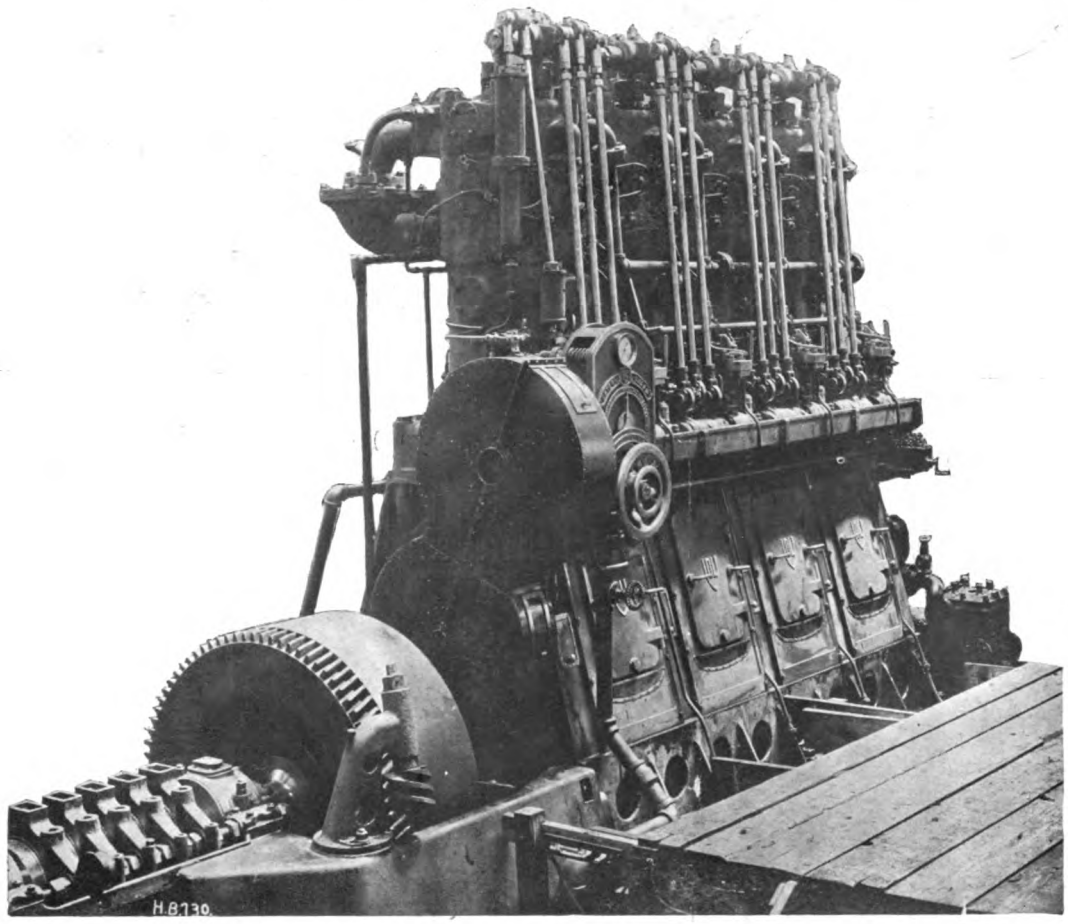
DE LA VERGNE



400 H. P. MARINE OIL ENGINE ON TEST BLOCK

Two of these Engines ready for immediate shipment

NO AIR COMPRESSOR
IMMEDIATE STARTING
MEDIUM COMPRESSION
LOWEST FUEL CONSUMPTION
USES ANY FUEL OR CRUDE PETROLEUM
HIGHLY DEVELOPED SOLID INJECTION SYSTEM

Our organization has been building high duty stationary crude oil engines for nearly thirty years. The De La Vergne Marine oil engine has all the advantage of this experience.

Sizes offered are from 400 to 800 H. P.

Early deliveries offered on the smaller sizes.

De La Vergne Machine Company

1225 East 138th Street

NEW YORK CITY

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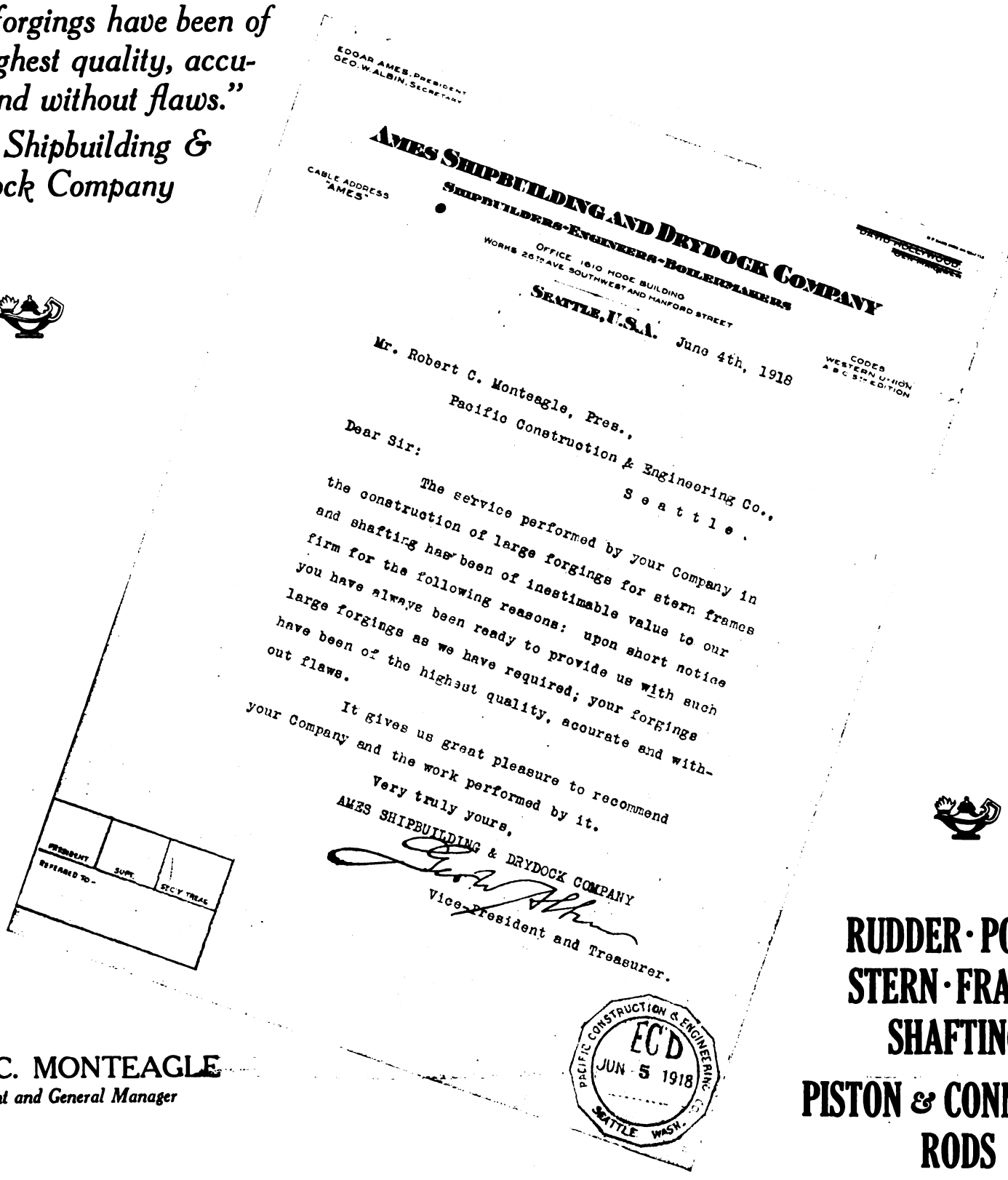
HEAVY·SHIP·FORGINGS

"Your forgings have been of the highest quality, accurate and without flaws."
Ames Shipbuilding & Drydock Company



EDGAR AMES, President
GEO. W. ALBIN, Secretary

AMES SHIPBUILDING AND DRYDOCK COMPANY
SHIPBUILDERS-ENGINEERS-BOILERMAKERS

CABLE ADDRESS "AMES"

OFFICE 1810 HOGE BUILDING
WORKS 26TH AVE. SOUTHWEST AND MANFORD STREET
SEATTLE, U.S.A.

CODES WESTERN UNION A B C 5TH EDITION

June 4th, 1918

Mr. Robert C. Monteagle, Pres.,
Pacific Construction & Engineering Co.,
S e a t t l e .

Dear Sir:

The service performed by your Company in the construction of large forgings for stern frames and shafting has been of inestimable value to our firm for the following reasons: upon short notice you have always been ready to provide us with such large forgings as we have required; your forgings have been of the highest quality, accurate and without flaws.

It gives us great pleasure to recommend your Company and the work performed by it.

Very truly yours,
AMES SHIPBUILDING & DRYDOCK COMPANY
Vice-President and Treasurer.

PRESIDENT | SUPT. | SEC'Y TREAS.
REFERRED TO -

PACIFIC CONSTRUCTION & ENGINEERING CO. ECD JUN 5 1918 SEATTLE WASH.

ROBT. C. MONTEAGLE
President and General Manager

RUDDER·POSTS
STERN·FRAMES
SHAFTING
PISTON & CONNECTING RODS

Pacific Construction & Engineering Co.

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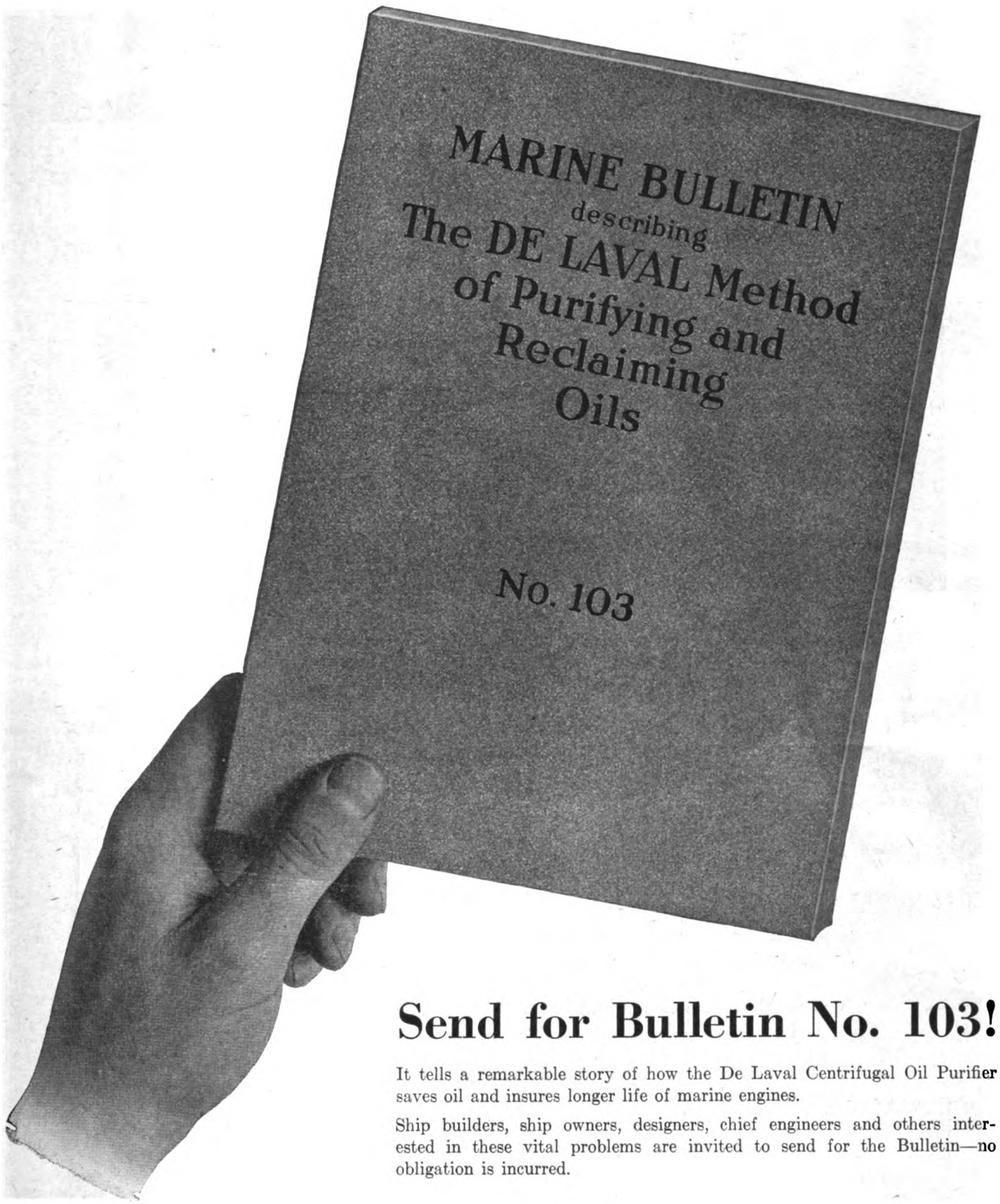

Send for Bulletin No. 103!

It tells a remarkable story of how the De Laval Centrifugal Oil Purifier saves oil and insures longer life of marine engines.

Ship builders, ship owners, designers, chief engineers and others interested in these vital problems are invited to send for the Bulletin—no obligation is incurred.

THE DE LAVAL SEPARATOR CO.

165 Broadway, New York **29 East Madison Street, Chicago**

World's Largest Makers of Centrifugal Machinery

Manufacturers' Selling Agents
De Laval Dairy Supply Co.
SAN FRANCISCO

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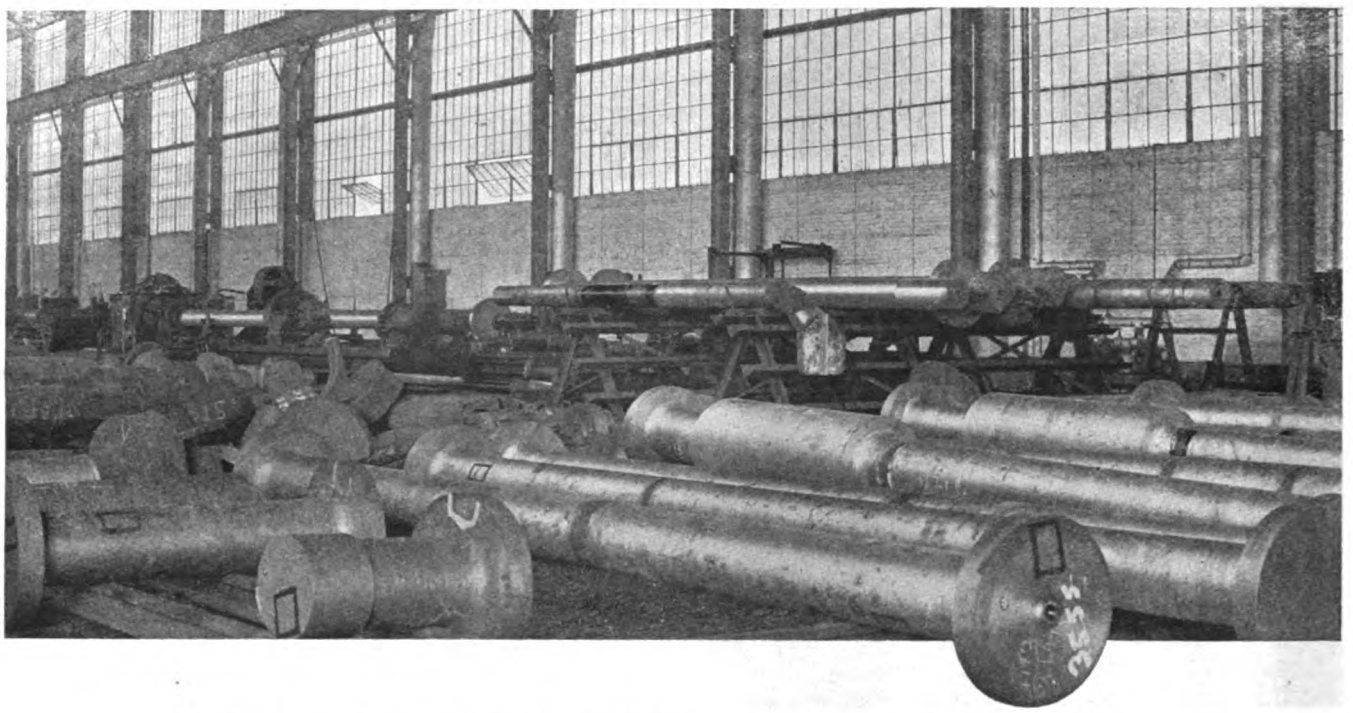

DON'T STOP

to wonder whether we can make your forgings.

CAMDEN FORGINGS

are made for innumerable purposes.

We are interested in knowing of your forging requirements. We know that we can interest you in our plant and its product.

Let these considerations lead to our receipt of your forging inquiries.

BUYERS' MEMO

- High and Low Carbon Bars
- Press Columns and Rams
- Pull Back Cylinders
- Water Cylinders
- Valve Bodies
- Plungers
- Weldless Steel Rings
- Lathe Spindles, solid and hollow bored
- Long Feed Screws
- Power Press Crank Shafts
- Rudder Arms
- Rudder Stocks
- Cam Shafts
- Eccentric Shafts
- Crusher Shafts
- Gear and Pinion Blanks
- Locomotives: Side and Main Rods; Crank Pins; Axles; Rod Straps; Guides; Parts of frame both in iron and steel
- Hammered Iron Bars for locomotive repairs
- Marine Shafts
- Marine Connecting and Eccentric Rods
- Rolls: Bending; Feed; Straightening; **Embossing**
- Large Wrenches
- Saw Arbors
- Steam Engine Forgings
- Pump Crank Shafts
- Pump Connecting Rods
- Large Nuts
- Turbine Shafts
- Mill Shafting
- Trolley Car Axles
- Electric Motor Axles
- Any forging to your print, and specifications, in either iron or steel.

CAMDEN FORGE CO.
CAMDEN, N.J., U.S.A.

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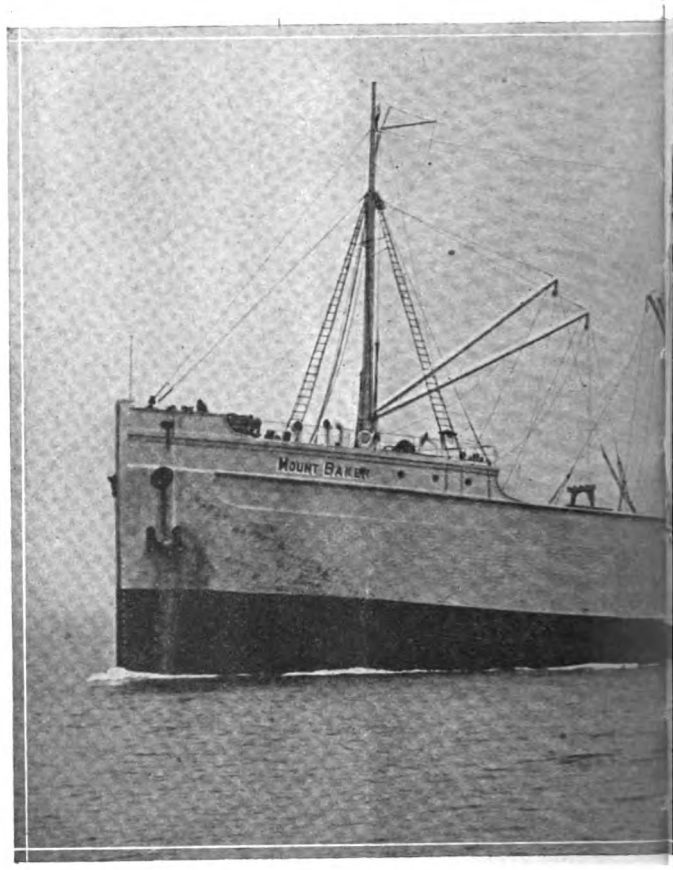
Wi

OIL DIESEL TYPE



The "Mount Baker" of the Globe Line Fleet is a 285' x 44' 7½" x 26' Cargo Motorship.

Designed by F. A. Ballin, built by the Supple-Ballin Shipbuilding Corp., Portland, Ore. She has double diagonal planking and steel plate topsides.

Gross tonnage is 2909, net tonnage 2433 and she has carried a total dead weight of 4600 tons.

"MOUNT BAKER" IS EQUIP

The "Mount Baker" of the Globe Line for a boat of her type—a pair of Winto efficient, economical and dependable shi one, both for actual mileage covered an

What Winton Oil Engines have done a in YOUR ships. Write us for detailed etc.

WINTON ENGINE WORKS

Seattle Representative---H. W. STA

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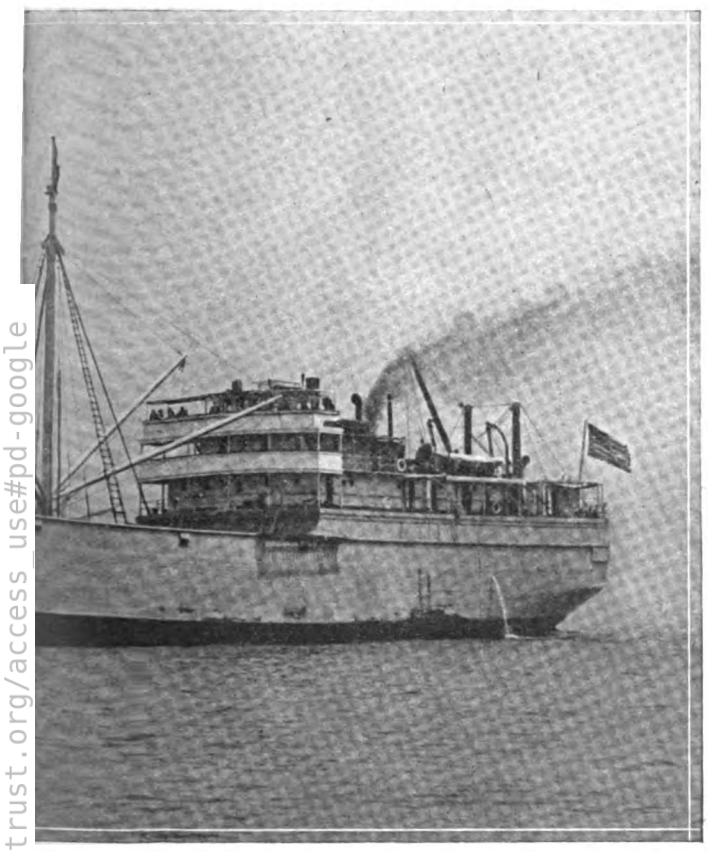
ENGINES



TH WINTON OIL ENGINES

s equipt with the logical power plant Engines. So powered she is a highly r record for the past year is a remarkable uick loading and unloading of cargo.

doing in the "Mount Baker" they can do nation as to sizes, horsepower developed,

The "Mount Baker" is powered with a pair of eight cylinder Winton Oil Engines of the Diesel Type. Bore 12 15/16″; stroke 18″, developing 450 H. P. at 225 R.P.M. direct connected.

Our Engineering Department actively co-operated with the builders of the "Mt. Baker" in working out the details of the power plant installation. We will be only too glad to co-operate with you in a like manner.

CLEVELAND, OHIO, U. S. A.

T, SUNSET ENGINE COMPANY

© 1919. Rex W. Wadman, Inc.

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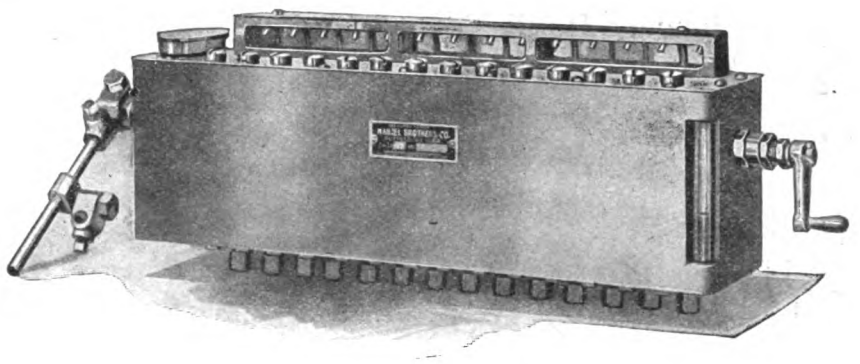
Feeds the oil regularly and in just the right quantities



The Oiler with the Piston Valves

Lubricate Your Engine Cylinders and Bearings with the "Manzel" Positive Force Feed Oiler

ENGINES EQUIPPED WITH "MANZEL" OILERS LAST LONGER - REQUIRE LESS ATTENTION - USE LESS OIL.

The "Manzel" Force Feed Oiler has been designed to lubricate the cylinders and bearings of Heavy Duty Engines economically and effectively.

It supplies fresh oil regularly and in just the right quantities.

It prevents the formation of carbon.

It can be easily and accurately adjusted, while the engine is running, to supply any amount of oil required, and will supply small or large quantities with equal regularity.

It is easy to adjust, simple to install and positive always.

Each feed is adjusted independently.

The "Manzel" Force Feed Oiler contains no ball valves, small springs, or checks, and has no complicated mechanism.

It is operated on the Piston Valve principle, and is the only oiler of its kind on the market.

It is simple in construction—absolutely positive in operation.

It will pump against any pressure required and will handle heavy or light oil.

It may be run in either direction and at high or low speed.

It will oil your engine cylinders and bearings the way they should be oiled.

"Manzel" Oilers are made in sizes and styles to fit any engine.
The Manzel factory is devoted entirely to the manufacture of Force Feed Oilers, and we are in a position to furnish exactly what you need, and to make prompt delivery of oilers in any quantities.

Write for Catalogue

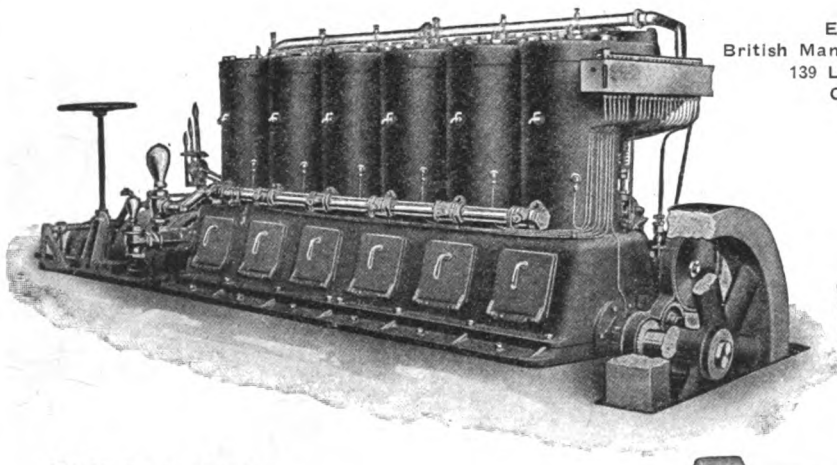
Manzel Brothers Company

ESTABLISHED 1898 INCORPORATED 1905

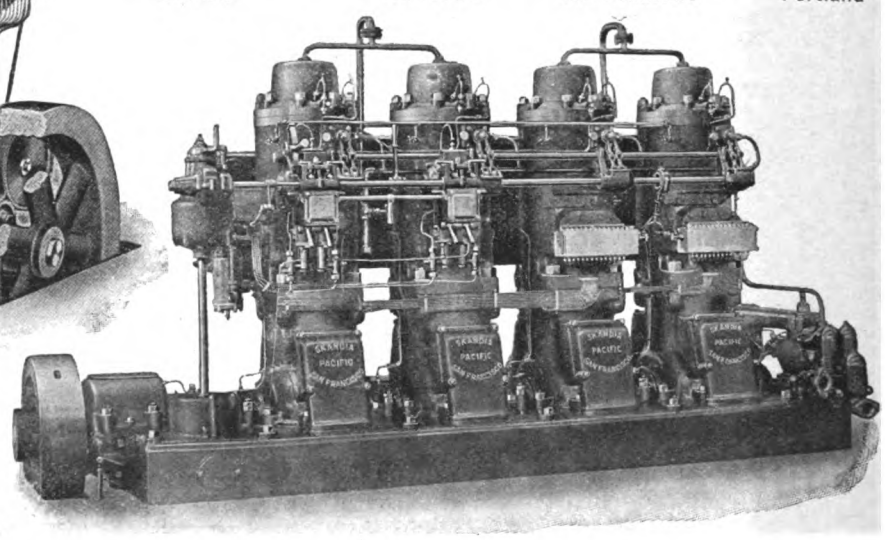
300-302 Babcock Street **Buffalo, N. Y., U. S. A.**

BRANCH OFFICES:

England — British Manzel Oil Pump Co., 139 Lowther St., Carlisle
Norway — Th. Bull, Raadhusgatan 9, Christiana
California — H. K. Moulthrop, 356 Market St., San Francisco
Oregon — J. J. Langmack, 213 Gerlinger Bldg., Portland



200 H. P. six-cylinder
Heavy Duty Kerosene Engine,
Built by Wolverine Motor Works,
Equipped with a "Manzel" 22-feed 2-compartment oiler



240 H. P. Direct Reversible Oil Engine,
Built by Skandia Pacific Oil Engine Company,
Equipped with two "Manzel" 14-feed oilers.

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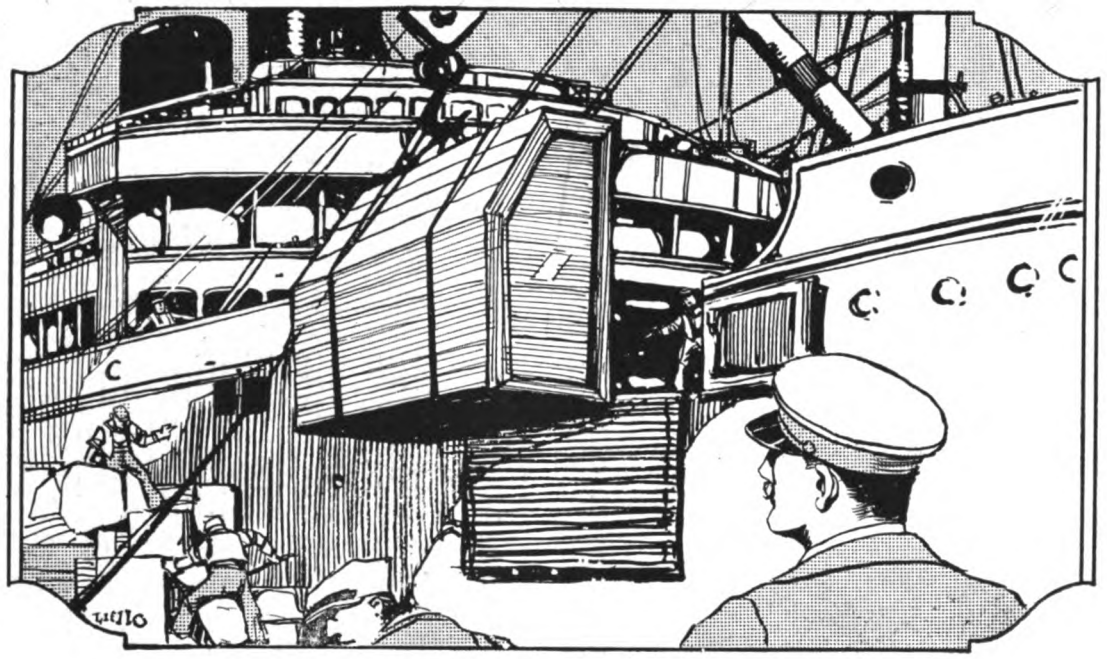

More Cargo Space

STEAMERS burning fuel oil need less bunker space and less weight of fuel than coal burners. They provide more cargo space in ships of equal register and develop greater speed and steaming radius. They require a smaller stoke hole gang.

Standard Fuel Oil for Bunker Use is carefully refined—feeds freely and evenly—furnishes clean, intense heat—assures ample steam and maximum speed from dock to dock—and smaller costs for every hour at sea.

This company is in a position to make deliveries at North and South American ports as well as European ports.

STANDARD OIL CO. (NEW JERSEY)
26 Broadway FUEL OIL DEPARTMENT New York, N.Y.
STANDARD OIL CO. OF LOUISIANA
New Orleans, La.

STANDARD FUEL OIL
For Bunker Use

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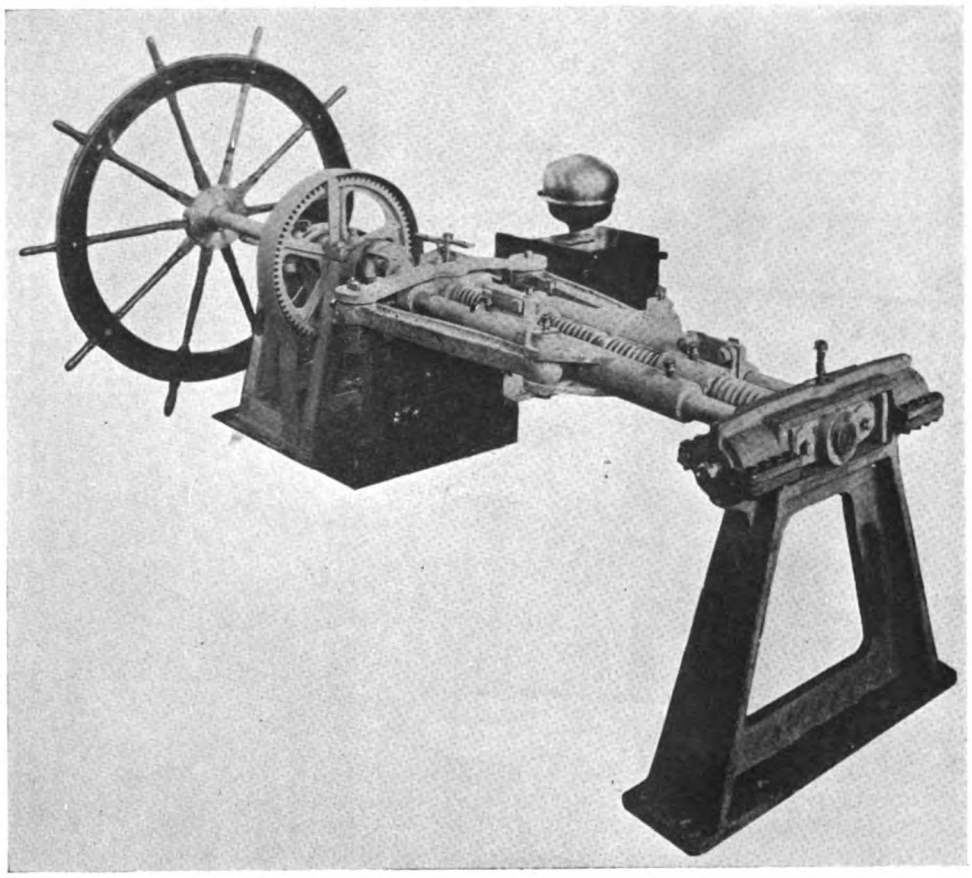
It Is Beautifully Simple

ne Auxiliaries

BARGES OR SAILING VESSELS



Electric Steering Engine For Australian Motorship "Benowa" (Similar Gear Being Furnished for Four Sister Motorships)

imple right and left hand screw type.

afety telemotor with helm indicator.

nstantaneous action-- No uncertainty--Overtravel protected against by limit switches.

omplete line of anchor windlasses--cargo winches--capstans--steering gears--generating sets, etc. for ships of any tonnage.

nd in successful operation in 21 motorships.

Manufacturing Co., Inc.

EATTLE---*"Seaport of Success"* U. S. A.

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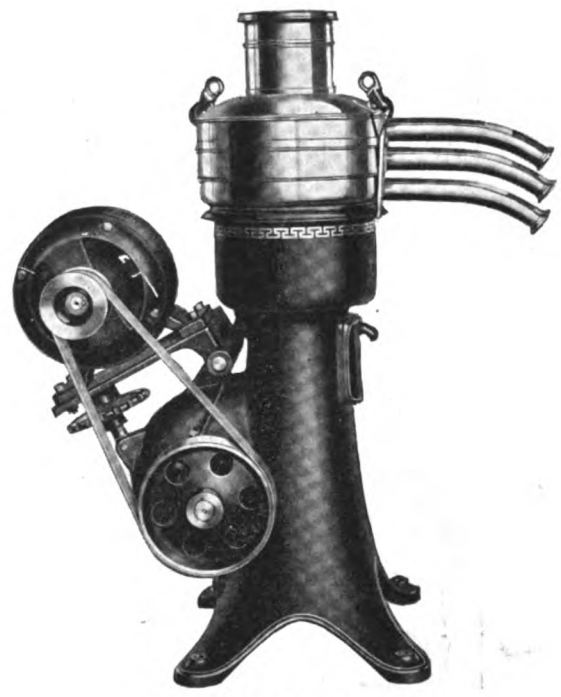
THE DE LAVAL OIL PURIFIER is dependable

The De Laval Centrifugal Oil Purifier can be depended upon to purify used crank case and other lubricating oils, and return them to their original lubricating qualities. Grit, dirt, water and carbon are successfully and instantly removed.

The Oil Purifier is much preferable to any other method of purification, as it handles a much larger quantity of oil, is positive in action and is not affected by the motion of the ship. It occupies less than two square feet of space. It is furnished in three sizes; each size in either electric, belt or direct steam turbine drive.

The De Laval Oil Purifier is now in use on many vessels of various types, including U. S. destroyers.

Write to nearest sales headquarters for Crank Case Oil Bulletin No. 102, and also for Marine Bulletin No. 103



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Electric Driven

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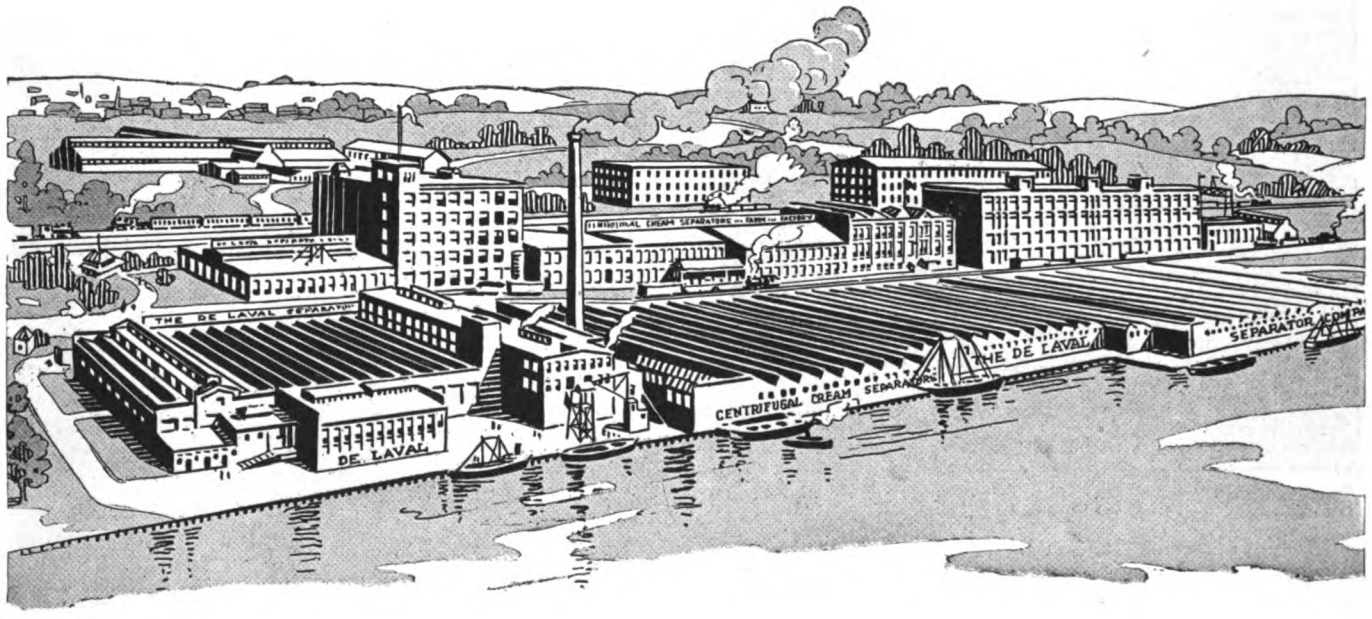
Largest Manufacturers of Centrifugal Machinery in the World

Manufacturers' Selling Agents

De Laval Dairy Supply Co.
San Francisco, Cal.



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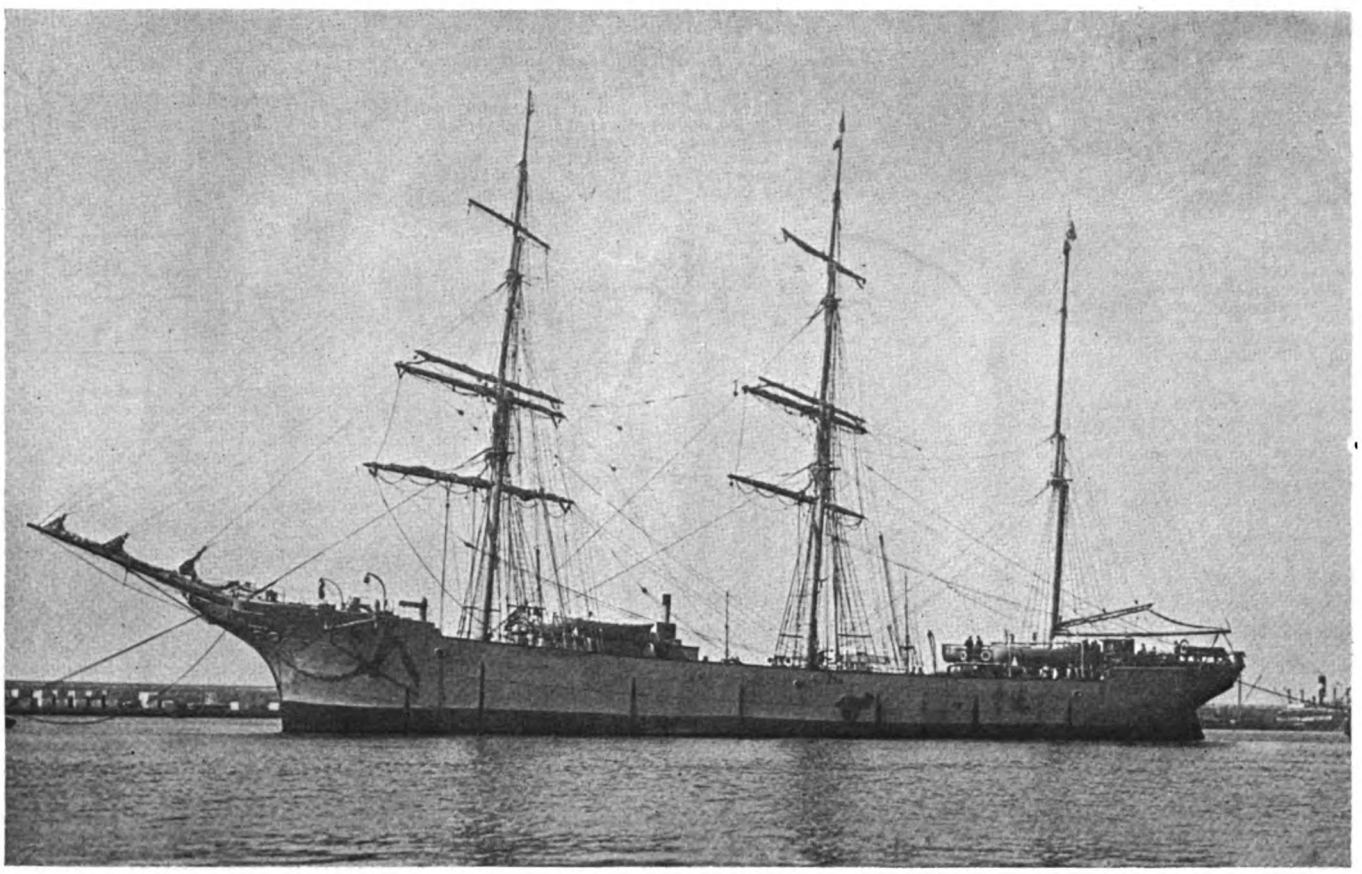
FRANCO TOSI
SOCIETA' ANONIMA
LEGNANO - MILANO
— ITALY —

DIESEL ENGINES FOR DECK AND ENGINE-ROOM AUXILIARY PLANTS ON MERCANTILE AND NAVAL SHIPS.



Auxiliary Schooner equipped with two 350 H. P. Tosi Engines

MORE THAN 100,000 B. H. P. IN USE ON 1200 CYLINDERS UP TO 400 B. H. P. PER CYLINDER.

LICENSEES
IN
UNITED STATES—ENGLAND—FRANCE

NEW YORK
198 BROADWAY

LONDON
92 VICTORIA STREET
WESTMINSTER

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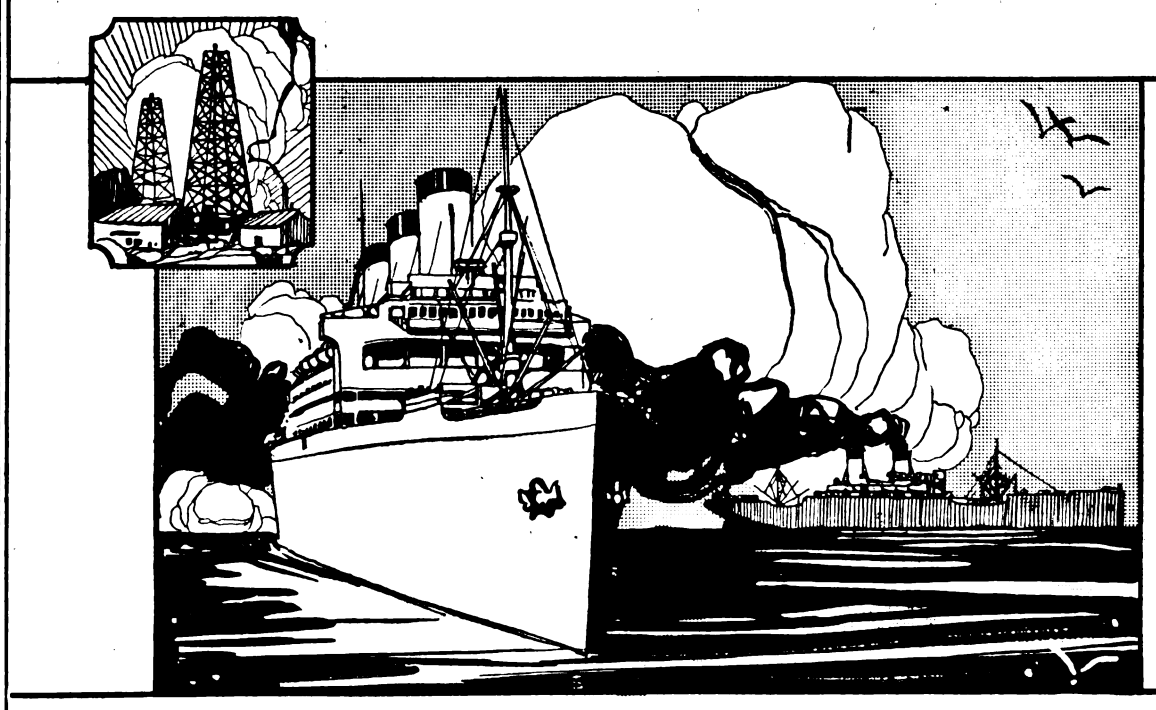

No Soot or Cinders

PASSENGERS prefer oil burning ships because they are cleaner than coal burners—no soot and cinders to dirty the decks, chairs or clothes.

Oil burners make better time, have a wider steaming radius, take a smaller crew, have more cargo space and less boiler wear and tear than coal burners. They are more economical to operate.

Standard Fuel Oil for Bunker Use is carefully refined, uniform and clean-burning. It assures maximum steam at minimum cost for fuel.

This company is in a position to make deliveries at North and South American ports as well as European ports.

STANDARD OIL CO. (NEW JERSEY)
26 Broadway FUEL OIL DEPARTMENT New York, N.Y.

STANDARD OIL CO. OF LOUISIANA
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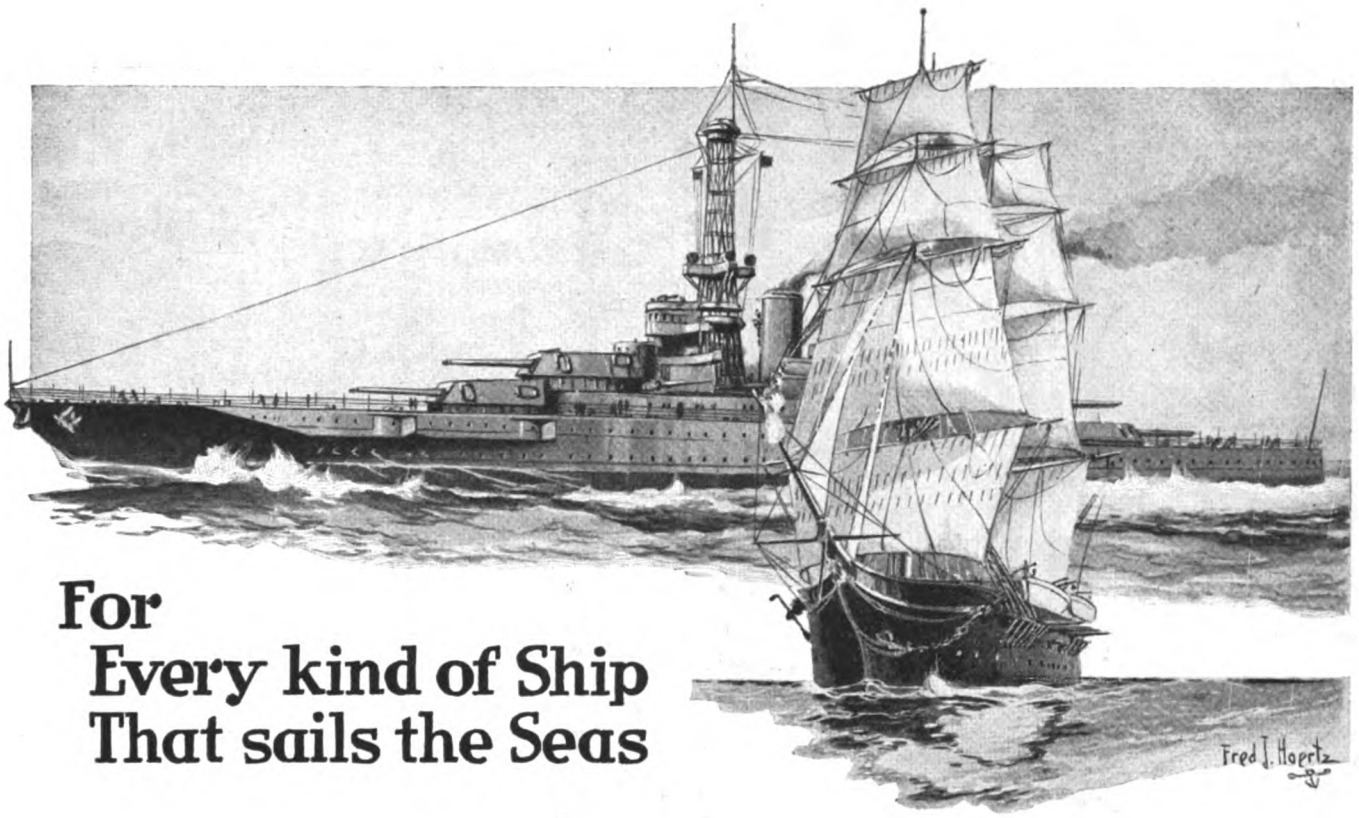

For Every kind of Ship That sails the Seas

Square-rigger, cruiser or dreadnought—the type makes little difference. The General Electric Company manufactures electric equipment for any size and type.

G-E propelling machinery drives the "New Mexico;" G-E ship lighting sets are found on hundreds of ships—on the small "coaster" and on the lumbering "tramp."

G-E equipment for marine use includes the following:—

- Internal Combustion Generating Sets
- Steam Engine Generators
- Turbo Generators
- Motors
- Mazda Lamps
- Arc Lamps
- Searchlights Incandescent and Arc
- Switchboards
- Meters and Instruments
- Wire and Cable
- Wiring Devices
- Telltale Boards
- Electric Radiators Tubular and Luminous

General Electric Company

General Office Schenectady, N.Y.

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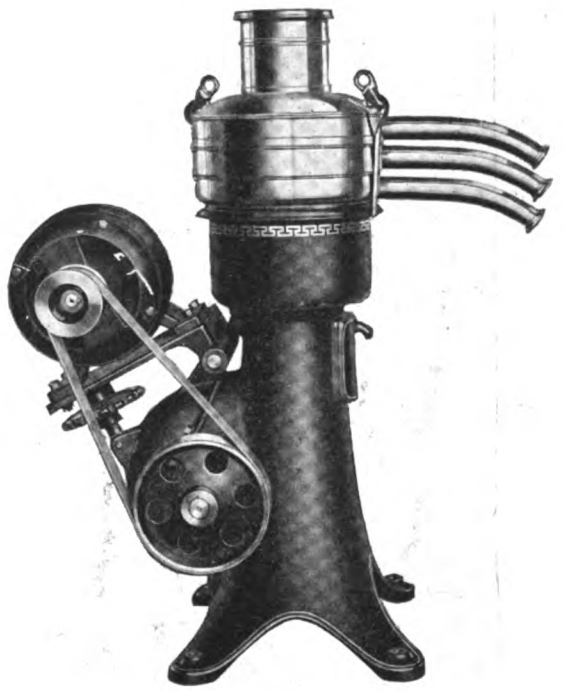
THE DE LAVAL OIL PURIFIER

The De Laval Centrifugal Oil Purifier is simple in construction and operation. This simplicity means long life and freedom from repairs, and is the outcome of over forty years of unquestioned leadership in the manufacture of centrifugal machinery.

The De Laval Oil Purifier is the simplest and, at the same time, the most effective means of eliminating grit, dirt, carbon, water and other impurities from crank case and other lubricating oils, instantly restoring them to original usefulness.

The Oil Purifier is built in three sizes and with electric, belt or direct steam turbine drive. It occupies less than two square feet of space and uses very little power.

Write to nearest sales headquarters for Crank Case Oil Bulletin No. 102, and also for Marine Bulletin No. 103.



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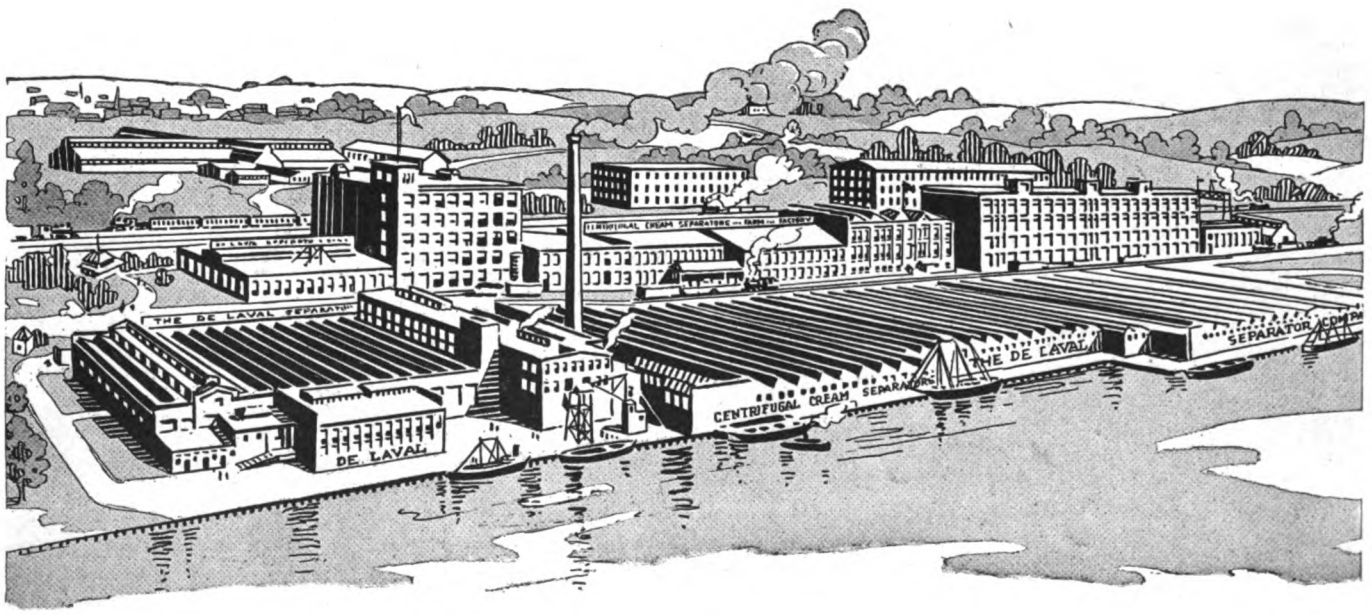

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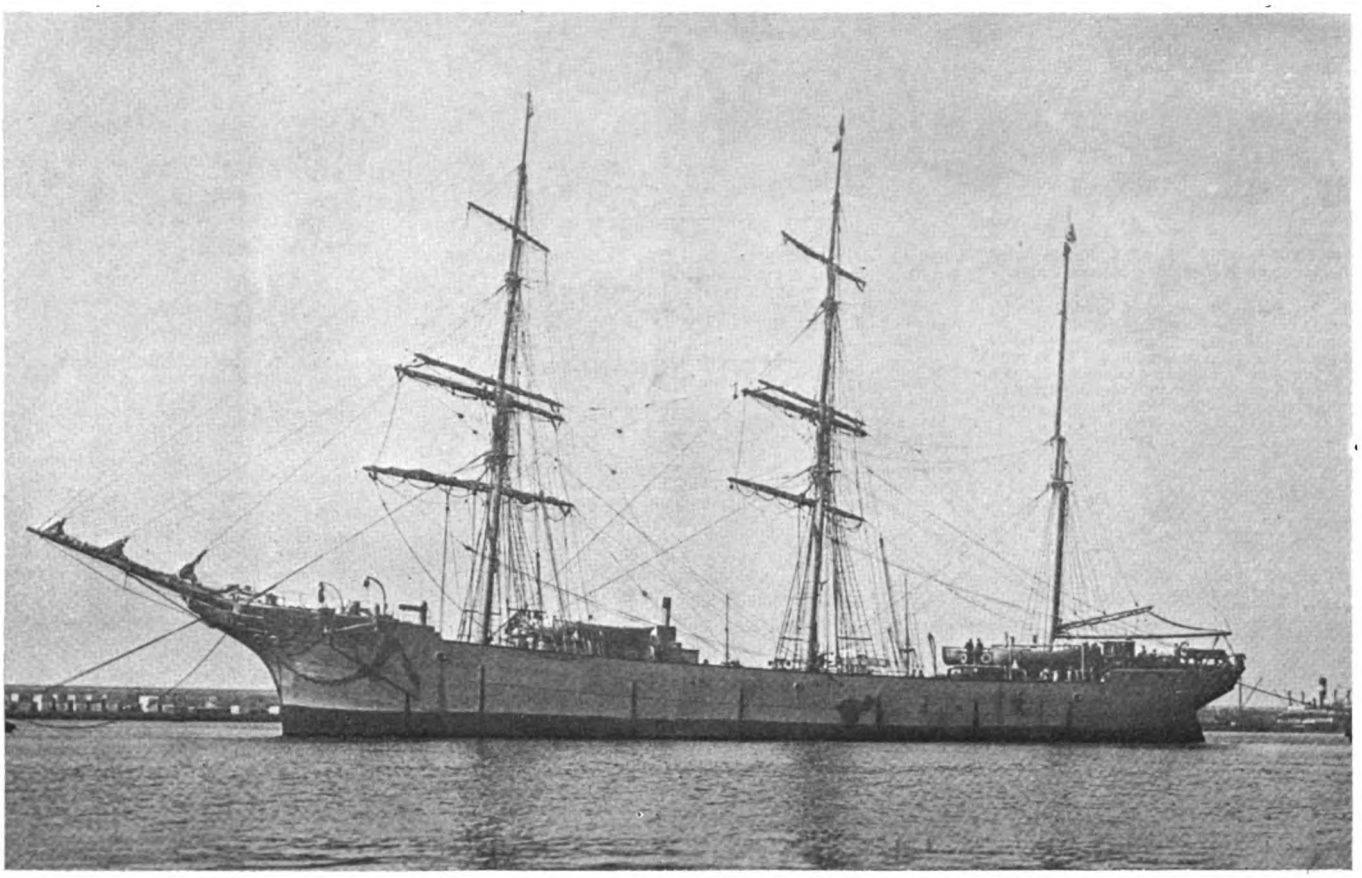

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UNITED STATES—ENGLAND—FRANCE

NEW YORK
198 BROADWAY

LONDON
92 VICTORIA STREET
WESTMINSTER

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Experienced Oils

Why Motorships especially require them

THE limited number of trained oilers and engineers in the motorship field is a natural condition. Such a condition exists in any new development. The war brought motorships rapidly to the front. The available supply of trained operators was taxed to the limit. It became necessary to train comparatively "green" men. This training takes time.

The importance of correct lubrication under these conditions can hardly be over-emphasized. Actual operating tests have proven that the grade of gargoyle D.T.E. oils recommended for a particular type of Marine Diesel engine will give freedom from lubrication difficulties in that engine.

Gargoyle D. T. E. oils are produced to fit the actual working needs of Diesel Type engines. They are made in different grades to meet individual needs.

A large percentage of all the motorships afloat today are lubricated with Gargoyle Marine Oils and the number is fast growing.

Send for booklet on Gargoyle D. T. E. Oils. It may save you a lot of operating expense.

GARGOYLE

Marine Oils

A grade for each type of service

VACUUM OIL COMPANY *Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the World.* **NEW YORK, U.S.A.**

Domestic Branches: New York Philadelphia Boston Pittsburgh Chicago Detroit Minneapolis Indianapolis Kansas City, Kan. Des Moines

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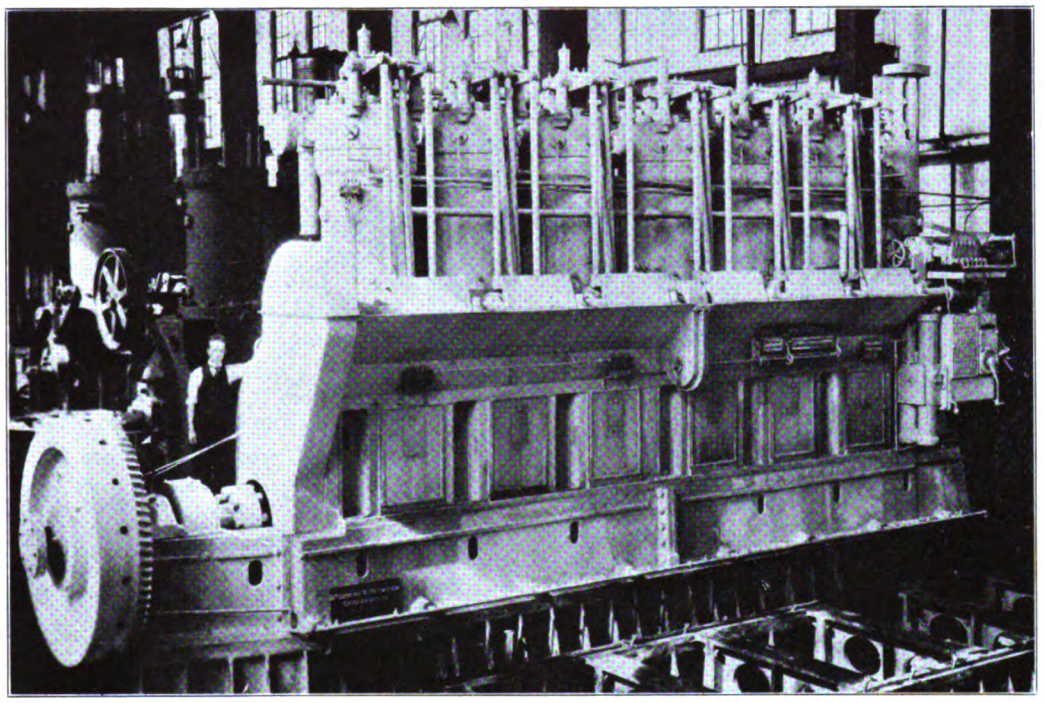
McINTOSH & SEYMOUR

HEAVY OIL

ENGINES

Sizes marine engines available: 390 I.H.P., 640 I.H.P., 960 I.H.P., 1300 I.H.P. 1550 I.H.P., 2000 I.H.P. All four-cycle, six-cylinder and directly reversible.



A Steamship can not compete with a Motorship. This is why it was a wise decision to arrange for Motorships in our shipbuilding program.

One of the 960 I.H.P. heavy duty marine engines we are building for the Emergency Fleet Corporation

A modern Motorship requires a smaller crew than a Steamship, and uses very much less fuel, which gives lower operating cost and more cargo capacity. We have the most complete plant devoted exclusively to the production of Diesel Type engines.

Vessel Owners and Builders are cordially invited to inspect our facilities.

McINTOSH & SEYMOUR CORPORATION

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NEW YORK CITY

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815 SHELDON BLDG.
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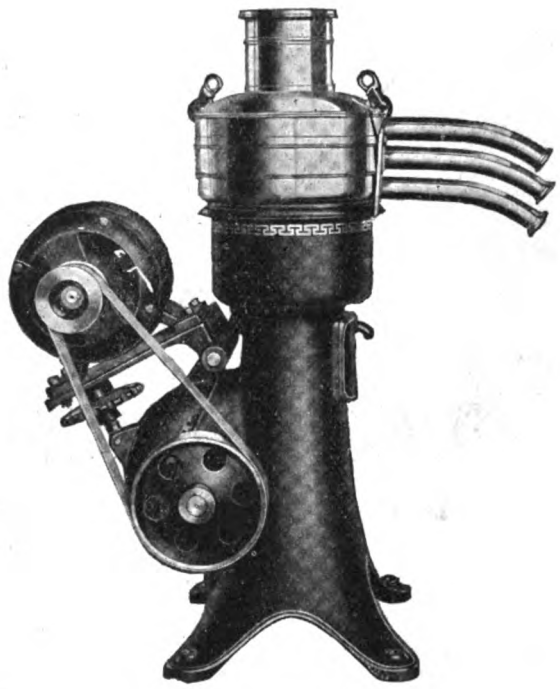
THE DE LAVAL OIL PURIFIER

The De Laval Centrifugal Oil Purifier is the most efficient means of purifying used crank case and other lubricating oils, and restore them to their original lubricating qualities. Grit, dirt, water and carbon are successfully removed.

The Oil Purifier is more efficient than any other method of purification as it handles a larger quantity of oil in less time and occupies less floor space. It is positive in action and is not affected by the motion of the ship and is made in three sizes and for either electric, belt or direct steam turbine drive.

The De Laval Oil Purifier is now in use on many vessels of various types, including U. S. destroyers.

Write to nearest sales headquarters for Crank Case Oil Bulletin No. 102, and also for Marine Bulletin No. 103.



De Laval Oil Purifier
Electric Driven

THE DE LAVAL SEPARATOR CO.

Largest Manufacturers of Centrifugal Machinery in the World

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New York

29 East Madison Street
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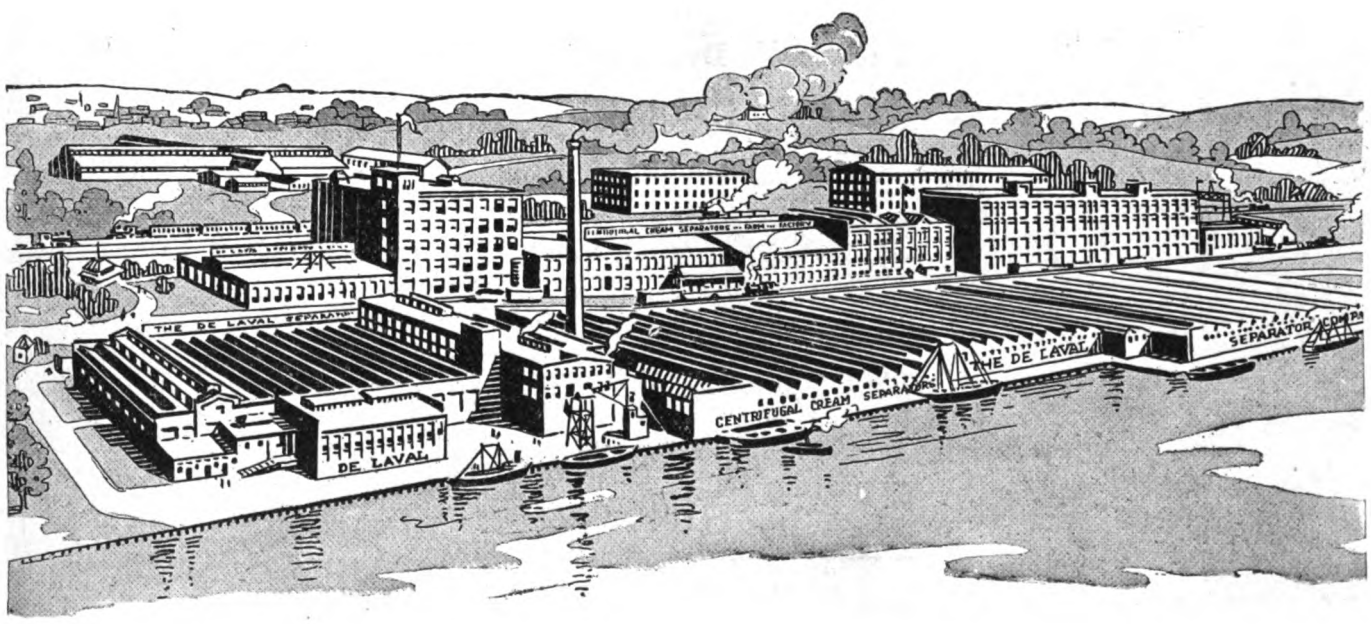
Manufacturers Selling Agents

De Laval Dairy Supply Co.
San Francisco, Cal.



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Scandinavian Shipowners

TODAY—

BUNKER-COAL AT CHRISTIANIA COSTS 130 KR. PER TON

FUEL-OIL AT CHRISTIANIA COSTS 190 KR. PER TON

BUT—

A FOUR-CYCLE ENGINED DIESEL-SHIP WILL RUN 4½ TIMES THE DISTANCE ON THE SAME WEIGHT OF FUEL AS THE AVERAGE STEAM TRAMP

We are Prepared to Furnish the Most Up-to-Date Designs and Quotations for—

DIESEL SHIPS *DIESEL ENGINES* *AUXILIARIES AND EQUIPMENT*

— TO SUIT YOUR REQUIREMENTS. COMPARATIVE CALCULATIONS OF ECONOMIC RESULTS OF MOTORS, TURBINES AND RECIPROCATING ENGINES SPECIALLY SUBMITTED TO ENABLE SHIPOWNERS TO OBTAIN THE BEST RESULTS

UP TO OCTOBER 1st, 1919, WE HAVE SUPPLIED, OR ON ORDER, TO SCANDINAVIAN SHIPOWNERS—

19 Werkspoor Diesel Engines Totalling 27,700 i. h. p.

34 Werkspoor Diesel-Driven Dynamos for Ship's Auxiliaries

9 Werkspoor Diesel Ships Aggregating 49,650 Tons Deadweight

OTTO KAHRS KOMMANDITAKTIESELSKAB

EXCLUSIVE AGENTS IN SCANDINAVIA FOR THE

WERKSPOOR CO. OF AMSTERDAM

CHRISTIANIA — — — AND — — — — BERGEN
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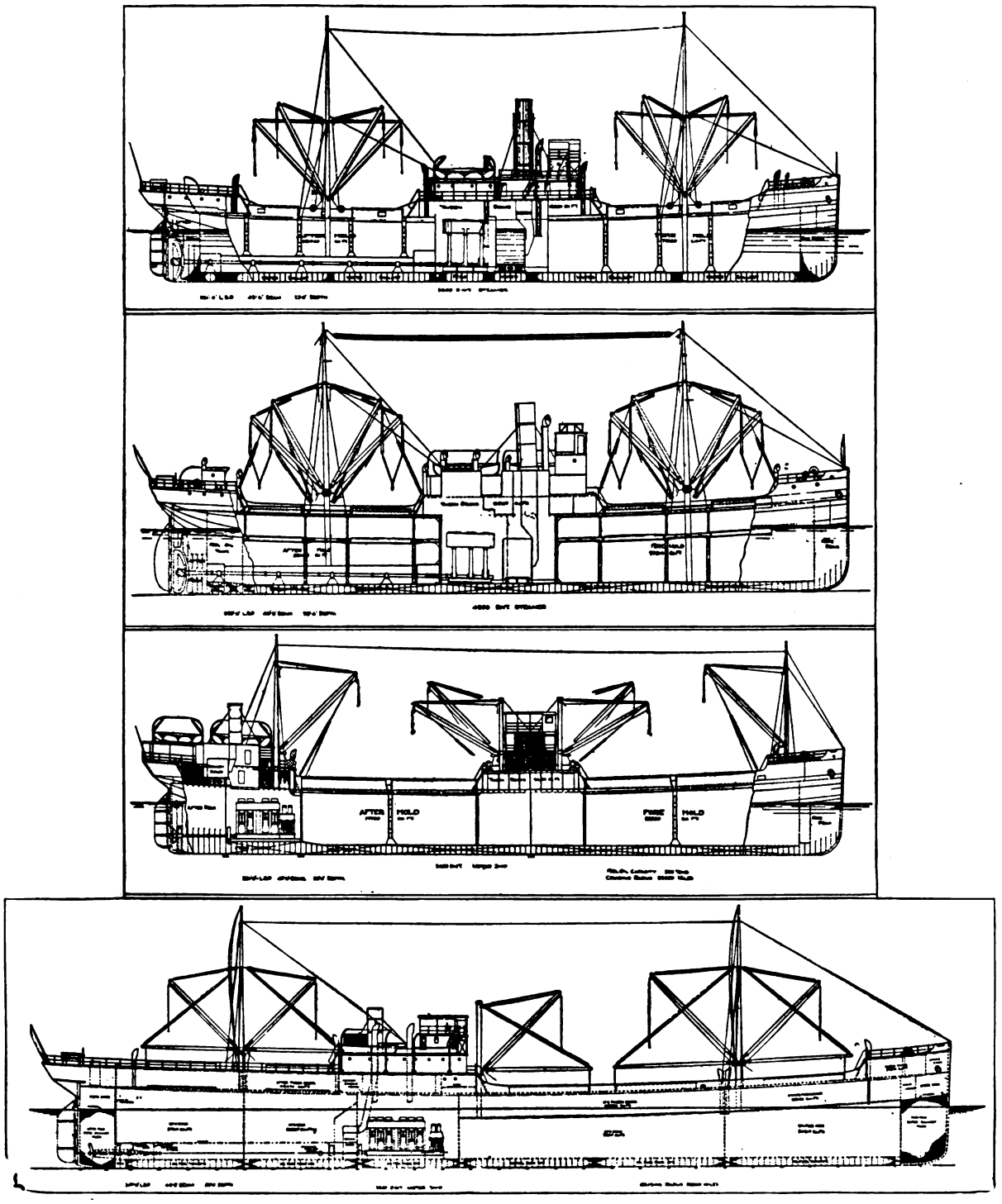
Manitowoc Shipbuilding Co.



Standard ocean-going steam and motor ships.

Designers and builders of steel vessels, marine engines, boilers, ship auxiliary machinery, etc.

Manitowoc, Wisconsin

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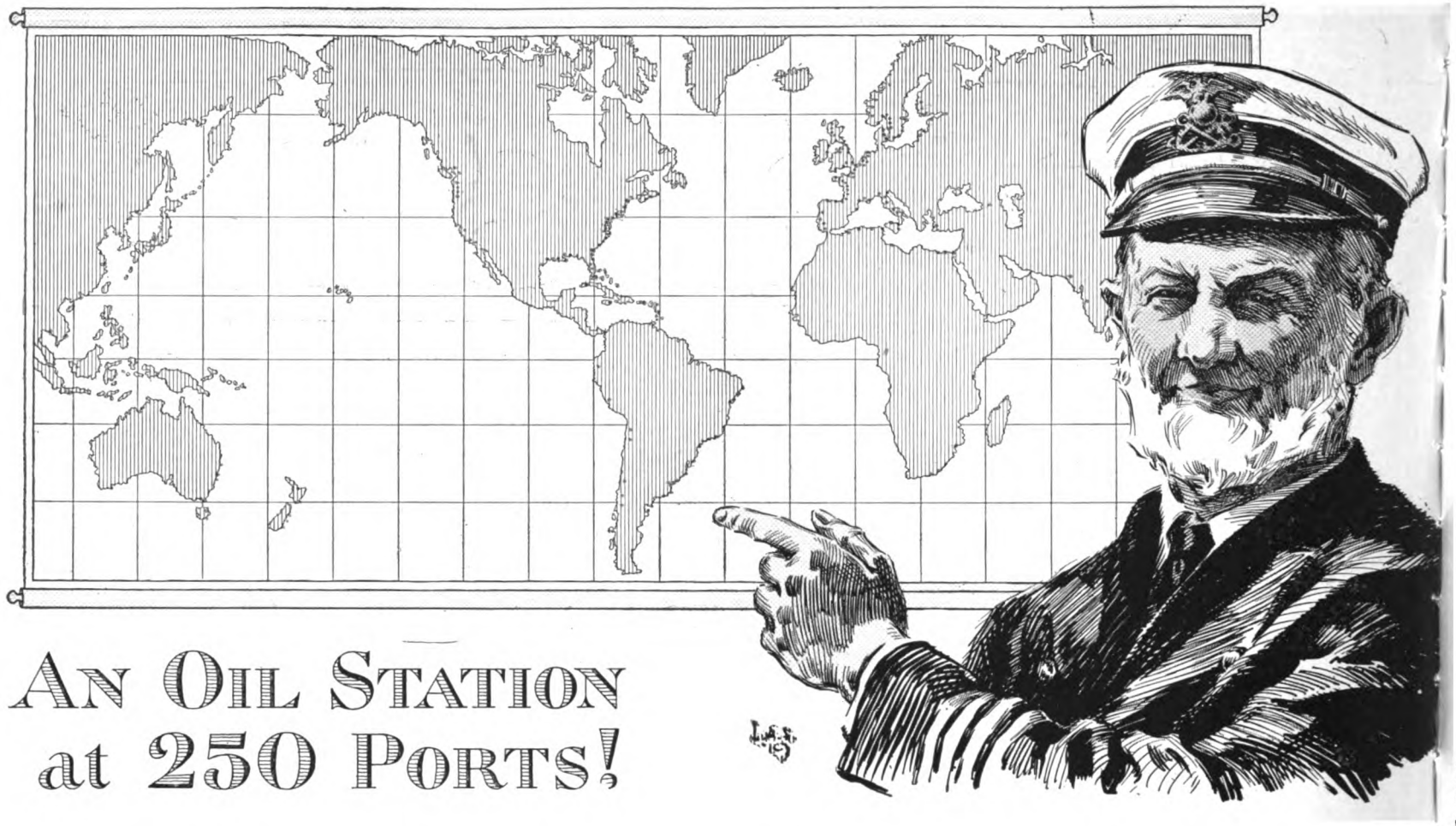

An Oil Station at 250 Ports!

GARGOYLE MARINE OILS can be obtained at practically every important port in the world. Today there are over 250 ports where the Vacuum Oil Company maintains an oil station and this number is being constantly added to.

At each of these ports will be found a representative competent to take care of the lubricating needs of Diesel Type engines. This service is always at the disposal of captains and engineers of motorships.

Gargoyle D. T. E. oils are always uniform whether they are bought abroad or in this country. The purchaser of a certain grade of D. T. E. oils can be certain that he is getting exactly this grade, whether the delivery be made in China, in India or in New York.

Captains and chief engineers of motorships have been quick to take advantage of the world-wide service rendered by the Vacuum Oil Company. A large percentage of all the motorships afloat today are lubricated with Gargoyle Marine Oils. And this number is rapidly increasing.

Send for booklet on Gargoyle D. T. E. oils. It will give you valuable pointers on the lubrication of all types of Diesel Engines.

Marine Oils

A grade for each type of service

VACUUM OIL COMPANY *Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the World.* **NEW YORK, U.S.A.**

Domestic Branches: New York Philadelphia Detroit Minneapolis Kansas City, Kan. Boston Pittsburgh Chicago Indianapolis Des Moines

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United States Shipping Board Emergency Fleet Corporation

Offers for Sale

116 Steamship Hulls 5 Sailing Vessels 61 Converted Barges

Wood Construction of the following type and tonnage:

Steamship Hulls	Converted Barges	Sailing Vessels
108 Ferris, 3850 t.	*55 Ferris, 3550 t.*	*3 Ferris, 3850 t.*
4 Gray's Harbor, 4300 t.	*3 Hough, 4400 t.*	*2 Kirby, 2000 t.*
2 Geary, 5000 t.	*2 Allen, 3850 t.*	
2 Hough, 4300 t.	*1 Continental, 1600 t.*	

Price Bare Hulls

Ferris Type, $75,000, Other Types, $21.40 per D. W. T.

Any equipment now on hulls to be paid for in accordance with an appraisal under our standard bill of material.

Hulls are moored at:

Portsmouth, N. H.; Wilson's Point, Conn.; Hog Island, Penna.; Beaumont, Texas; Lake Union, Seattle, Wash.; Alameda, Calif.; Columbia Slough, Portland, Ore.; Coos Bay, Ore.

These hulls are in various stages of completion. Some finished, others on the ways, at various shipyards in the Atlantic, Gulf and Pacific Coasts, which permits the purchaser making changes to suit his requirements.

Built to requirements of American Bureau of Shipping or British Lloyd's Register they represent, at above price, extraordinary value. A temporary certificate of classification furnished with each vessel so far as constructed.

A complete equipment as specified in Bill of Material No. 500 for Ferris Hulls will be furnished on the basis of $100,000 for each vessel.

Further data may be had on application to Supply and Sales Division, United States Shipping Board Emergency Fleet Corporation, 140 N. Broad St., Phila., or at any of the following district sales offices:

139 Centre Street, New York City; Custom House, Boston, Mass.; 140 N. Broad St., Phila., Pa.; Hibernia Bank Bldg., New Orleans, La.; 922 Edison Bldg., Chicago, Ill.; Northwestern Bank Bldg., Portland, Ore.; Securities Bldg., Seattle, Wash.; 369 Pine St., San Francisco, Calif.

U. S. Shipping Board Emergency Fleet Corporation

140 NORTH BROAD STREET, PHILADELPHIA

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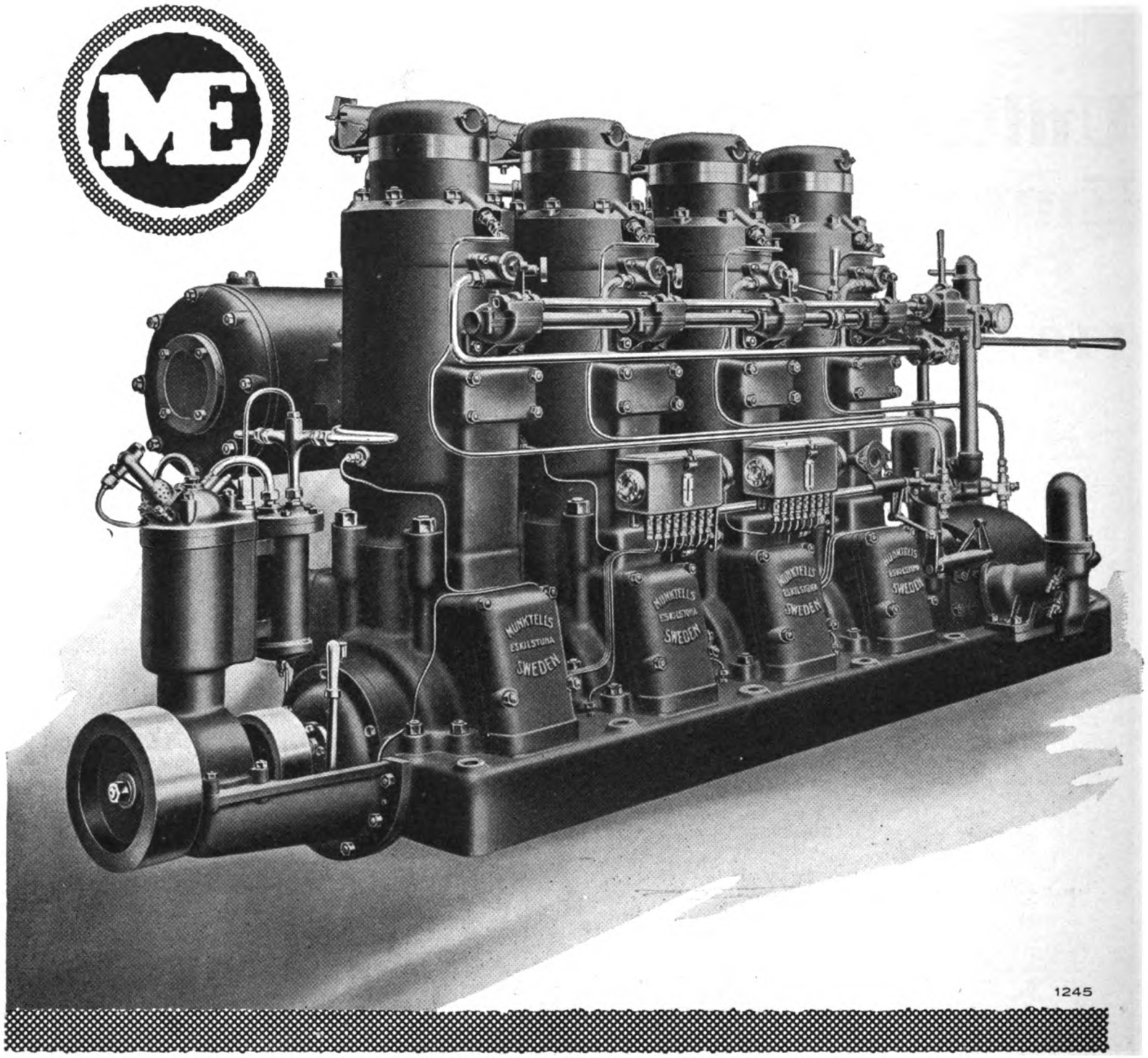
MUNKTELLS



PAT. SEMI DIESEL

CRUDE OIL ENGINES

5-500 B.H.P.

MUNKTELLS MEK. VERKSTADS AKTIEBOLAG · ESKILSTUNA · SWEDEN

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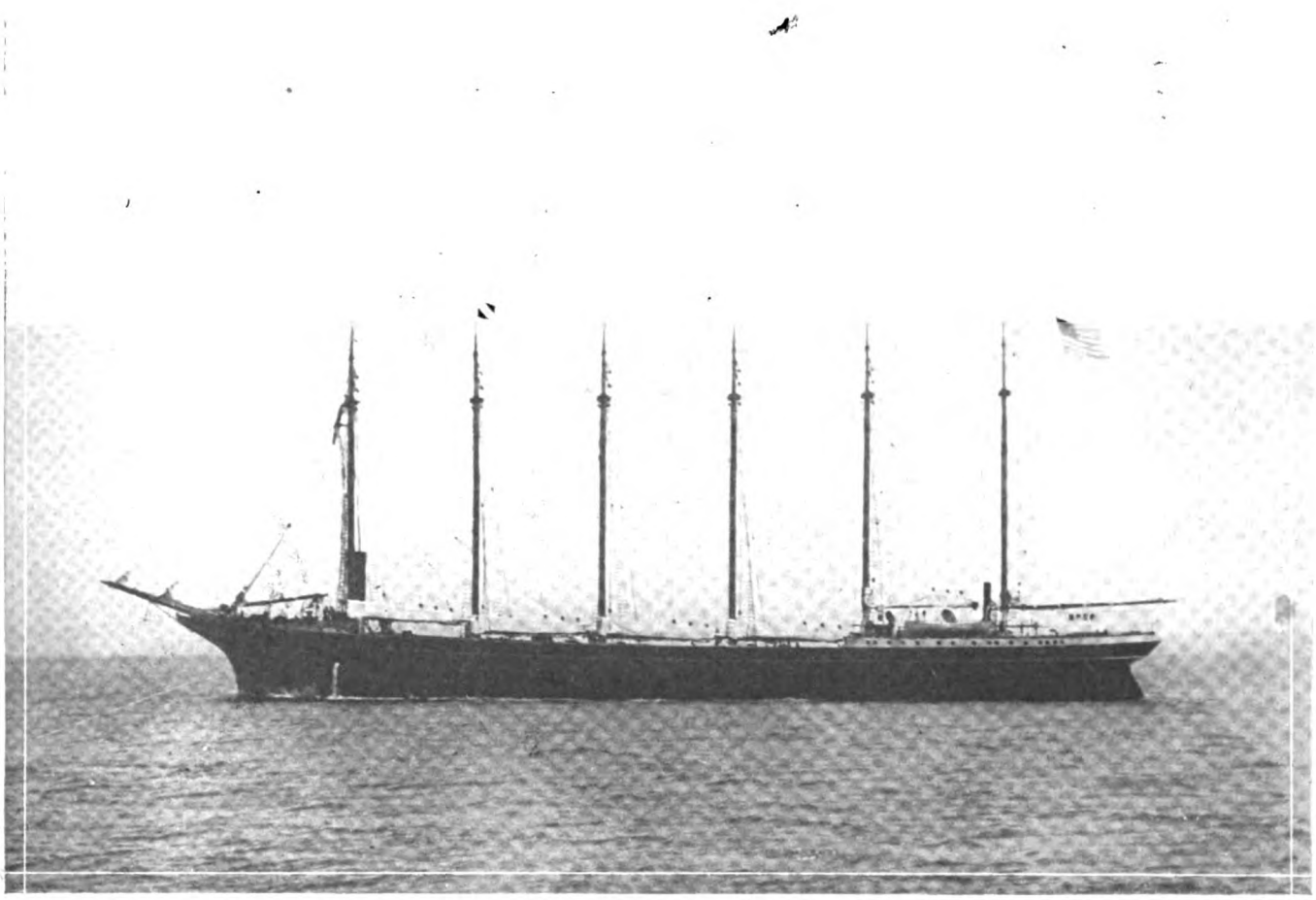
BOLINDERS



MOTORSHIP "KATHERINE"—Philippine Vegetable Oil Company's latest tanker, 286 ft. 9 in. x 43 ft. 5 in. x 24 ft. 1 in. Gross weight, 2196 tons. Equipt with two 320 B.H.P. Type "MII" Bolinder Fuel Oil Engines. Speed 8 knots.

Built to be the finest of its type—this ship is Bolinder Equipped.

MOTORSHIP "KATHERINE," the latest addition to the fleet of tankers owned by the Philippine Vegetable Oil Company, has gained by her recent trial trips the most enthusiastic praise of naval experts.

Originally a four masted, square rigged, British built, iron sailing ship, she has been converted into a six masted, bald headed auxiliary schooner with total cargo capacity of 3,000 tons on 22 ft. draft. The substantial workmanship throughout, the most modern and efficient installations, together with her splendid showing on her trial trip, has earned for this ship the highest classification in Lloyds.

The Efficiency and Economy afforded the Philippine Vegetable Oil Company by BOLINDER ENGINES is likewise at your command.

BOLINDERS COMPANY, 30 Church St., New York City

Pacific Coast Representatives—HENRY LUND & CO., Marine Bldg., San Francisco, Cal.

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SHARE CAPITAL
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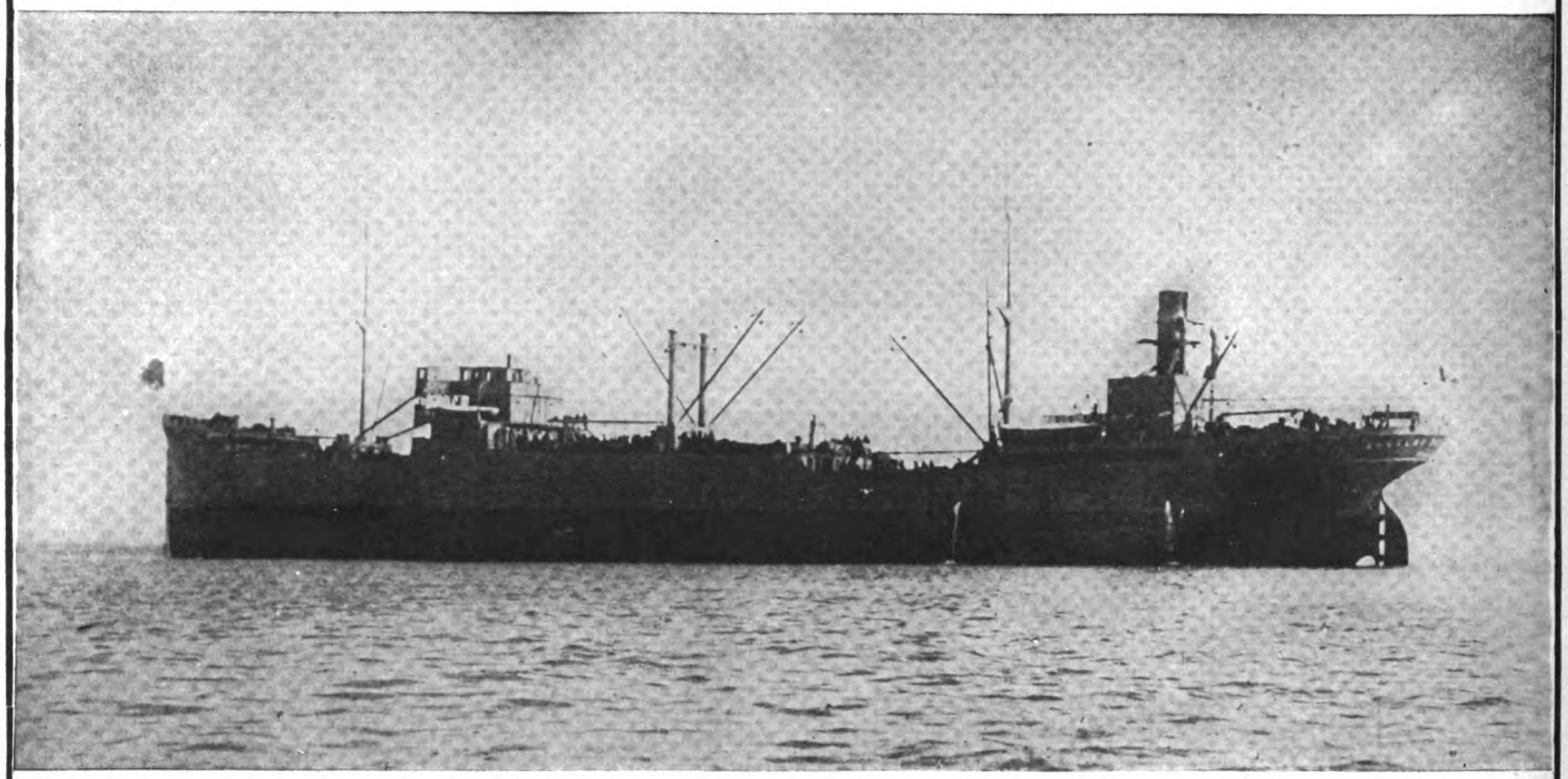
Societa Anonima Italiana

GIO. ANSALDO & CO.

Registered Office, Rome
Administrative and Industrial Office, Genoa, Italy
(Branch Office: 80 Maiden Lane, New York)

SHIPBUILDERS AND ENGINEERS

STANDARDIZED DIESEL-ENGINED MOTORSHIPS of 8100 Tons d.w.c. Each
built at Muggiano (Spezia)



The Society has at present at work, in its own 27 Establishments and other associated concerns, over 50,000 workmen and is principally building:

1st. Warships and mercantile vessels of all kinds and sizes from big super-dreadnoughts and ocean liners to destroyers, torpedo boats, submarines, cargo steamers, tug-boats, motor boats, etc.
2nd. Marine steam propelling engines, both reciprocating and turbine engines with and without gearing, also Diesel marine motors.
3rd. Steam boilers, both water-tube and cylindrical, of all types and sizes.
4th. Locomotives and tenders complete, and machine tools.
5th. Armour plates, guns, armoured turrets complete, ammunition complete, metallic cartridges and casings.
6th. Auxiliaries for propelling machinery, and all kinds of auxiliary machinery for ships, such as steering gears, capstans, winches, distilling condensers, and screw propellers.
7th. Dynamos and all electric appliances, auxiliary electric machinery both for ship and land service, electric gear for turrets and guns, elevators, steering gears, electric capstans and winches, cranes and electric propelling machinery.
8th. Aeroplanes and their motors.
9th. Steel, cast iron and bronze castings of all varieties and sizes.
10th. Steel forgings of all kinds and sizes, special steels and files.
11th. Boiler steel tubes; steel, iron, copper, and brass pipes.
12th. Furniture of all descriptions, both wood and metallic for warships, liners and mercantile vessels.

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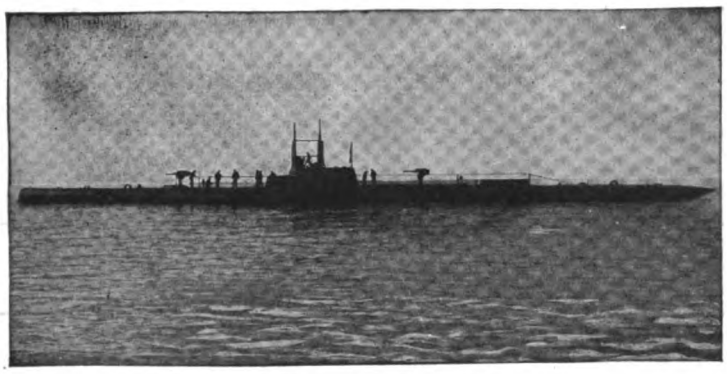
SHARE CAPITAL
22 MILLIONS OF LIRE (Fully Paid)

ANSALDO-SAN GIORGIO
(LIMITED)
Ex Fiat-San Giorgio

Shipyard, Muggiano (Spezia)
Offices and Engine Works, Turin, via Cuneo, 20, Italy

Specialists in the construction of:



SUBMARINE "FIAT-SAN GIORGIO"

Diesel and Steam Cargo Vessels, Torpedo Boats, Submarines, Diesel-Engined Submarine Chasers and Heavy-Oil Marine Motors (Type Fiat-San Giorgio)

such as were supplied to the Navies of

Brazil, Denmark, Great Britain, Italy, Portugal, Spain, Russia, Japan, United States and Sweden, and Germany (before the war)

Complete Construction of War and Merchant Ships. Cargo and Passenger Vessels of any Capacity. Ships equipped and repaired.

Heavy-Oil Marine Motors, type Fiat-San Giorgio, for War and Merchant Ships of any capacity.

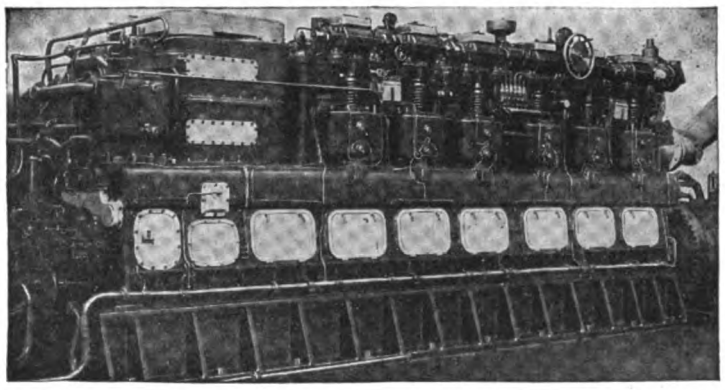
The Fiat-San Giorgio plants, which now show a continuous industrial development, will employ from 18,000 to 20,000 workingmen during the current year.

The Italian Emergency Fleet

The Spezia Shipyard every year will launch not less than 18 standardized Diesel Motorships of 8,100 to 10,000 tons D. W. capacity each, with complete equipment and machinery built by the FIAT-SAN GIORGIO exclusively, while the output of submarines and torpedo-boats will remain undiminished.

Guaranteed Results for Merchant Ship Motors (Model 2cy.—175=1200 b. h. p.):

—Reversing Motors from full ahead to full astern done in ten seconds.
—Fuel Consumption two-cycle engines, 0.45 lbs. heavy oil, high density containing up to 20% Pitchy and Tarry Matters.
—Lubricating Oil Consumption, 0.017 lbs.



FIAT-SAN GIORGIO HIGH SPEED MOTOR, 1350 B. H. P.

American Branch:
80 Maiden Lane, New York City

STANDARDIZED DIESEL-ENGINED MOTORSHIPS of 8100 Tons d.w.c. Each Now Building at Muggiano (Spezia)

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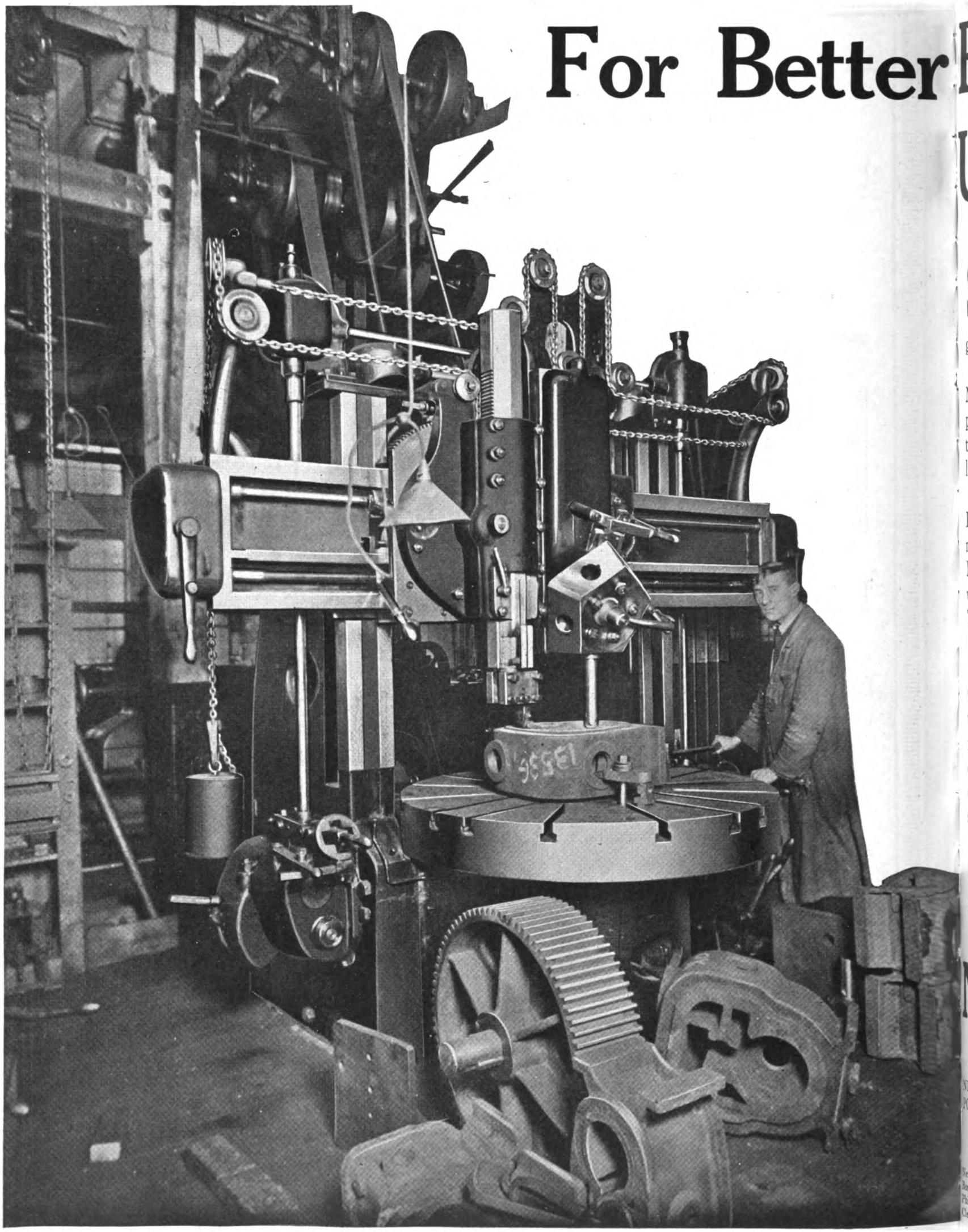

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ter Results in Shop Work Use N-B-P. Machine Tools

SHOPS that are doing big things in the building of high-class marine engines and motors are among the largest users of Niles-Bement-Pond machine tools—and for very good reasons.

Niles-Bement-Pond Machine Tools are essentially high-production machines. They cover the entire field of machine tool requirements. They range in size from the smallest to the largest built.

In addition to the machinery sold under the Niles-Bement-Pond name, we build the well-known Pratt & Whitney line of Precision Machine Tools, Gages, and Small Tools. At the Pratt & Whitney works the system of interchangeable manufacture was originated. This fact, we believe, specially qualifies us to tool up the most intricate job you handle.

Our wide experience in designing and manufacturing special tools, jigs and fixtures, and in preparing gages for shop and inspection measurement has been widely called upon by numerous manufacturers whose product requires such modern aids to efficient, economical production. Our service in this connection should be of value.

We'll be glad to cooperate with your engineers in the application of our equipment to your plant. Catalogues, bulletins, prices and full information is yours for the asking.

OUR LIST

N-B-P. Machine Tools

Lathes
Planers
Shapers
Slotters
Milling Machines
Boring and Turning Mills
Side Head Boring Mills
Boring, Drilling and Milling Machines
Horizontal Boring Machines
Radial Drills
Cylinder Borers
Multiple Drills
Electric Traveling Cranes
Jib Cranes
Wall Cranes
Electric Hoists
Trolleys
Forge Hammers
Drop Hammers
Tilting Hammers
Board Drop Hammers

Pratt and Whitney Precision Machine Tools

Bench Lathes
Turret Lathes
Engine Lathes
Screw Machines
Automatic Milling Machines
Thread Millers
Die Sinkers
Vertical Shapers
Spline Millers

Small Tools

Taps
Reamers
Drills
Dies
Die Stop Sets
Hobs
Hollow Mills
Milling Cutters
Punches and Dies, Etc.

NILES-BEMENT-POND CO.

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Two and Four-Cycle

Important

TO SHIPBUILDERS

CONSTRUCTIONAL LICENSES

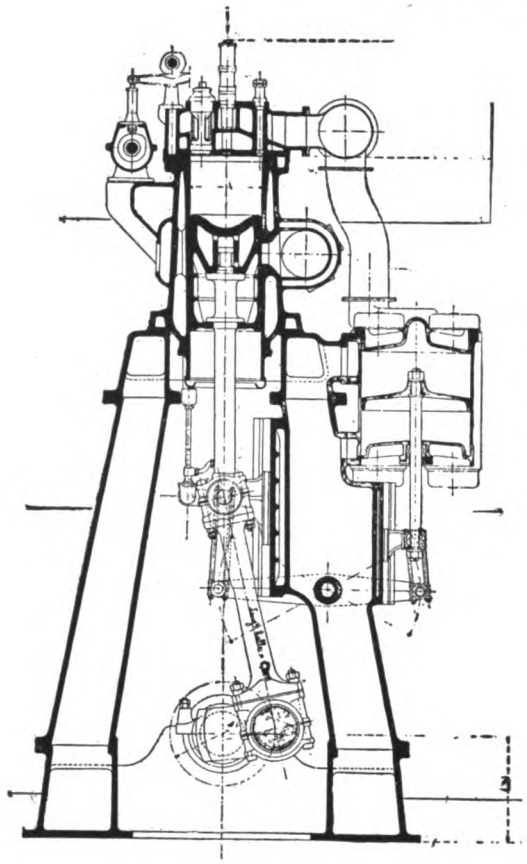
NOW THAT THE WAR IS OVER WE ARE PREPARED TO OFFER THE BENEFITS OF OUR EXTENSIVE MARINE AND STATIONARY DIESEL ENGINE EXPERIENCES TO THE U. S. A., AND ARE READY TO COMMENCE NEGOTIATIONS WITH RESPONSIBLE AMERICAN SHIPBUILDERS AND ENGINEERS WITH A VIEW TO GRANTING A CONSTRUCTIONAL LICENSE, OR LICENSES.

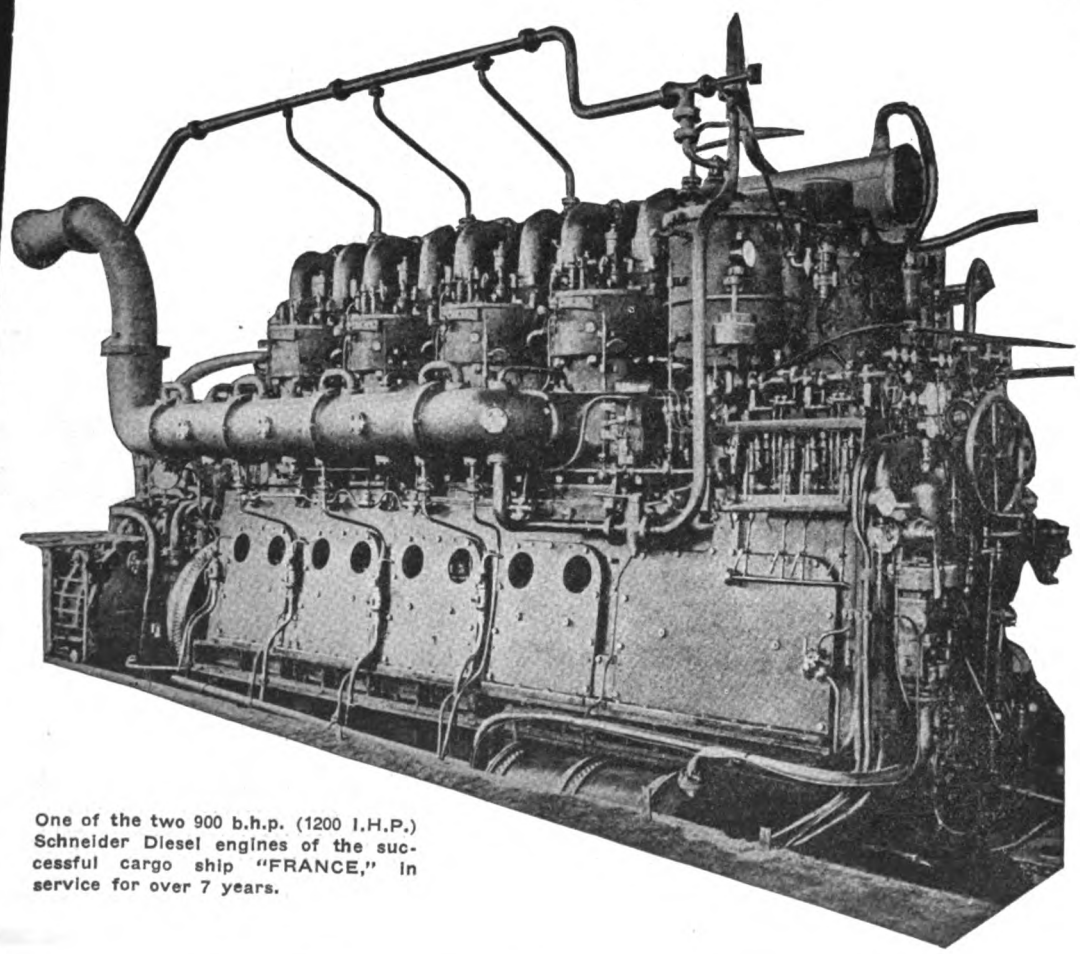
DURING THE WAR THE UNITED STATES FOUND OUR UNEQUALLED BIG-GUN EXPERIENCE INVALUABLE, AND UNDOUBTEDLY OUR DIESEL ENGINE KNOWLEDGE WILL PROVE JUST AS VALUABLE FOR THE PEACEABLE MERCHANT SHIPS OF THE PROBABLE FORTHCOMING GREAT AMERICAN MOTORSHIP-BUILDING PROGRAMME.

WORKING-DRAWINGS OF THE SCHNEIDER 1,500 SHAFT H.P. CROSSHEAD-TYPE, DIRECT-REVERSIBLE MERCHANT MARINE DIESEL ENGINE WILL SOON BE IN THE UNITED STATES, AND EXPERT CONSTRUCTIONAL AND DESIGNING ASSISTANCE CAN NOW BE SENT FROM OUR WORKS IN FRANCE. COMPLETE DETAIL DRAWINGS OF THE SCHNEIDER 1,450 B.H.P. NAVAL ENGINE ALREADY ARE IN NEW YORK. THESE MAY BE VALUABLE IN VIEW OF PROPOSED DIESEL-ELECTRIC DRIVE FOR CARGO SHIPS.

THE SCHNEIDER COMPANY IS THE LARGEST ENGINEERING AND SHIPBUILDING CONCERN IN FRANCE, AND ONE OF THE GREATEST IN THE WORLD. AT THE BACK OF THE SCHNEIDER TWO AND FOUR CYCLE TYPES OF DIESEL ENGINES IS THE SCHNEIDER REPUTATION.

Section of 1,500 b.h.p. Schneider merchant-ship two-cycle Diesel engine.





One of the two 900 b.h.p. (1200 I.H.P.) Schneider Diesel engines of the successful cargo ship "FRANCE," in service for over 7 years.

SCHNEIDER & Cie

21 E. 40th Street, NEW YORK, U. S. A.

NOW UNDER CONSTRUCTION ARE A NUMBER OF SCHNEIDER MERCHANT SHIP CROSSHEAD TYPE DIRECT-REVERSIBLE DIESEL ENGINES OF 1500 SHAFT H.P. IN 8 CYLINDERS. WORKING DRAWINGS OF THIS ENGINE SOON WILL BE IN THE U. S. A.

WE ALSO HAVE COMPLETED SOME DOUBLE-ACTING STATIONARY DIESEL ENGINES OF THE FOUR-CYCLE TYPE OF 2200—2600 SHAFT H.P. FOR POWER STATIONS. LICENSES TO BUILD THESE ENGINES CAN BE OBTAINED.

ALL COMMUNICATIONS

OUR NEW

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Marine Diesel Engines

Announcement

AND ENGINEERS

EXTENSIVE EXPERIENCE

FOR OVER 10 YEARS SCHNEIDER ET CIE HAVE BEEN ENGAGED IN THE CONSTRUCTION OF MARINE DIESEL ENGINES; AND, ESPECIALLY FOR DEVELOPMENT AND EXPERIMENTAL WORK WE BUILT A SINGLE-CYLINDER TWO-CYCLE MARINE DIESEL ENGINE OF 3 FT. 3½ INS. BORE AND STROKE WHICH DEVELOPED 1,200 SHAFT H.P. AT 150 R.P.M. ALSO A SINGLE-CYLINDER FOUR-CYCLE TYPE DIESEL ENGINE OF 18 1-16 INS. BORE AND STROKE THAT DEVELOPS 300 SHAFT H.P. AT 400 R.P.M. THESE UNITS HAVE GIVEN US INVALUABLE TECHNICAL DATA.

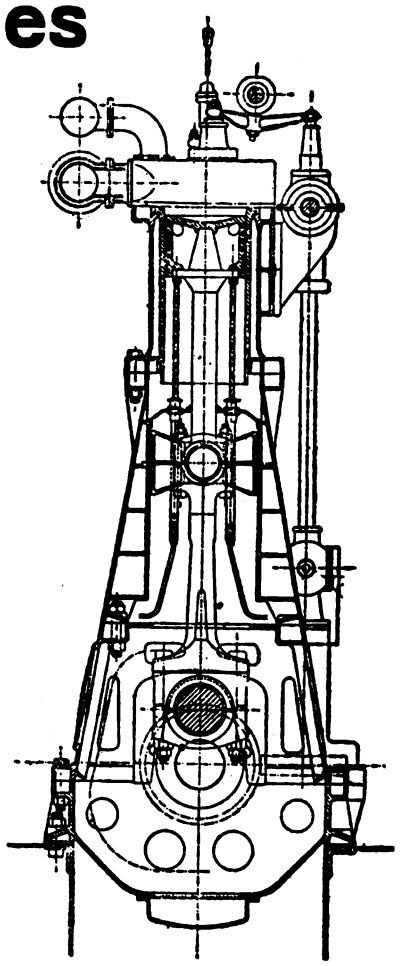
AMONG TWO-CYCLE AND FOUR-CYCLE MARINE DIESEL ENGINES BUILT AT OUR WORKS ARE THE FOLLOWING:

TWO	TWO-CYCLE REVERSIBLE ENGINES, EACH OF 2,400 SHAFT H.P. FROM EIGHT CYLINDERS 18½ IN. BORE AND STROKE AT 350 R.P.M. FOR THE "NEREIDE" OF THE FRENCH NAVY.
SIX	TWO-CYCLE REVERSIBLE ENGINES, EACH OF 1,600 SHAFT H.P. AT 330 R.P.M. FOR THE FRENCH NAVY.
EIGHT	TWO-CYCLE REVERSIBLE ENGINES, EACH OF 1,100 SHAFT H.P. AT 400 R.P.M. FOR THE FRENCH AND JAPANESE NAVIES.
TWO	TWO-CYCLE REVERSIBLE ENGINES, EACH OF 900 SHAFT H.P. AT 230 R.P.M. FOR THE CARGO-SHIP "FRANCE," IN REGULAR OCEAN SERVICE FOR OVER 7 YEARS.
TWO	FOUR-CYCLE REVERSIBLE ENGINES, EACH OF 700 SHAFT H.P. AT 300 R.P.M. FOR THE "ADMIRAL BOURGOIS" OF THE FRENCH NAVY.
SIX	FOUR-CYCLE MARINE ENGINES, EACH OF 650 SHAFT H.P. AT 400 R.P.M.
FOUR	FOUR-CYCLE MARINE ENGINES, EACH OF 510 SHAFT H.P.
EIGHT	FOUR-CYCLE MARINE ENGINES, EACH OF 360 SHAFT H.P. AND TWO OF 150 SHAFT H.P.

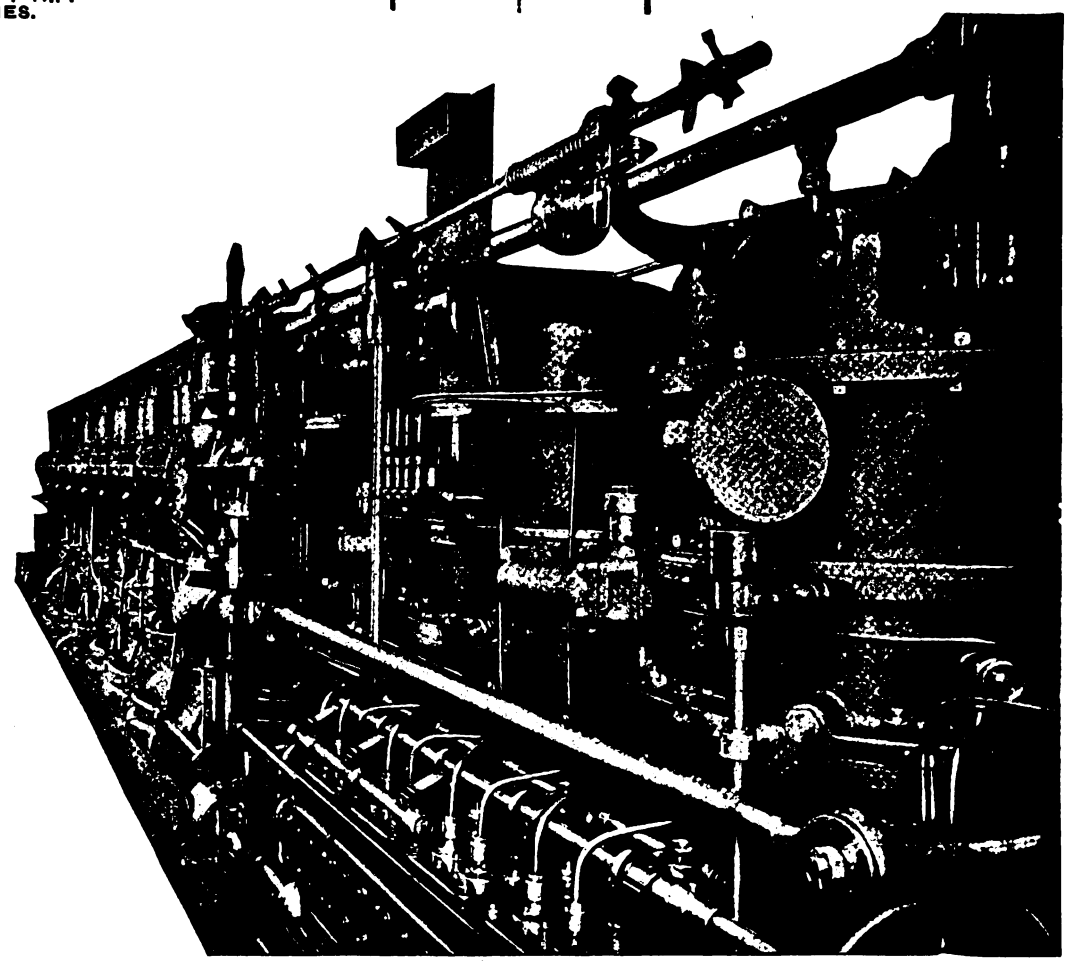
TOTAL—40 MARINE DIESEL ENGINES.

SCHNEIDER & Cie

PARIS, FRANCE



Section of 510 b.h.p. Schneider naval type four-cycle Diesel engine.



An 8-cylinder Schneider Diesel marine engine of 1,600 b.h.p. (2,100 I.H.P.)

THERE IS EVERY INDICATION THAT VERY SHORTLY THE UNITED STATES WILL ABANDON STEAMER BUILDING IN FAVOR OF DIESEL MOTORSHIP CONSTRUCTION. SO AMERICAN SHIP AND ENGINE BUILDERS SHOULD BECOME PREPARED BY SECURING LICENSES FROM EXPERIENCED DIESEL ENGINE BUILDERS.

APPLICATIONS FOR AMERICAN LICENSES SHOULD BE MADE TO THE NEW YORK OFFICE.

SCHNEIDER & Cie

21 E. 40th Street,
NEW YORK, U. S. A.

SHOULD BE SENT TO
YORK OFFICE

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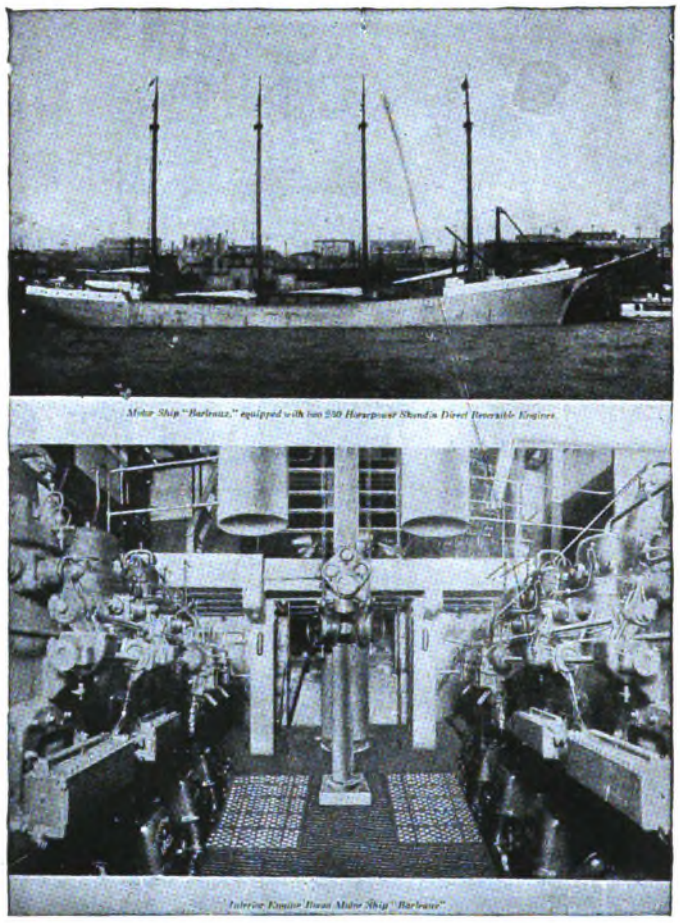
SKANDIA PACIFIC OIL ENGINE COMPANY

SKANDIA OIL ENGINES

Make Compact Installations

(Marine and Stationary)

Operate on Low Gravity, Crude or Fuel Oils



Motor Ship "Barlenuz," equipped with two 250 Horsepower Skandia Direct Reversible Engines.

Interior Engine Room Motor Ship "Barlenuz"

550,000 B.H.P. Now in Use and on Order

5 B.H.P. to 500 B.H.P.

5 B.H.P. to 500 B.H.P.

SKANDIA PACIFIC OIL ENGINE COMPANY

WORKS: OAKLAND, CALIFORNIA, U. S. A.

Northwestern Agents SKANDIA ENGINEERING CO.
101 Grand Trunk Dock, Seattle, Wash.

Eastern Agents H. S. JOHANNSEN
50 Church St. New York N. Y

SKANDIA MARINE OIL ENGINES

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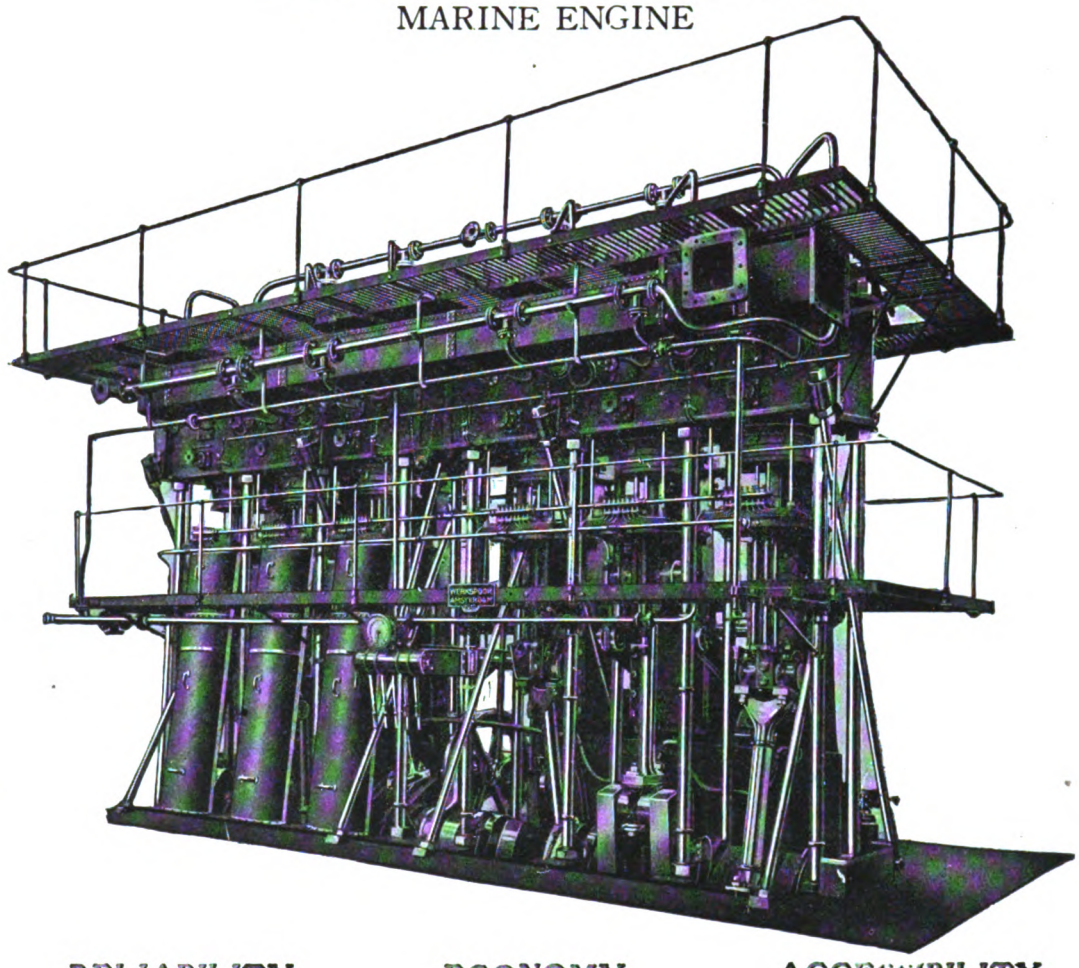
SKANDIA PACIFIC OIL ENGINE COMPANY

BUILDERS UNDER LICENSE OF THE

WERKSPOOR-DIESEL

MARINE ENGINE



RELIABILITY ECONOMY ACCESSIBILITY

Northwestern Agents
SKANDIA
ENGINEERING CO.
101 Grand Trunk Dock
Seattle, Washington

SKANDIA PACIFIC OIL ENGINE CO.
Balboa Building, San Francisco, Cal.
Works: Oakland, Cal.

Eastern Agents
H S. JOHANNSEN
50 Church Street
New York, N. Y.

WERKSPOOR MARINE ENGINES DIESEL

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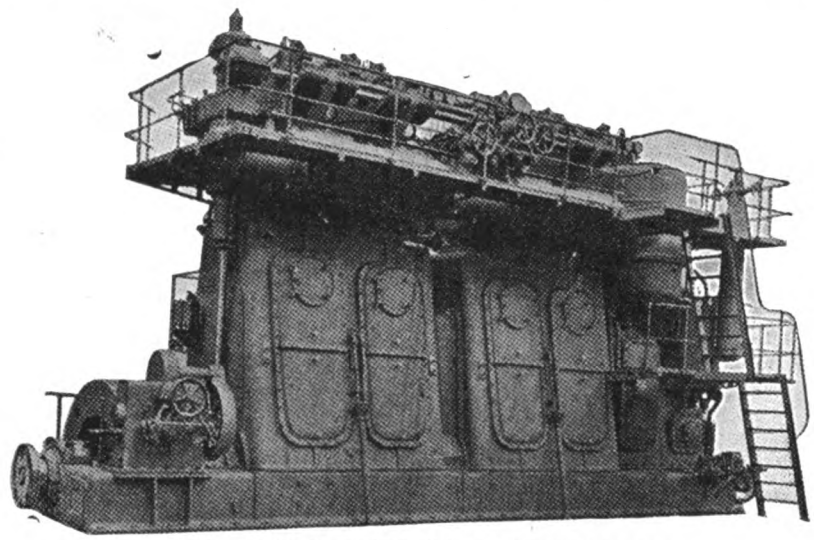
SULZER
FRÈRES

SULZER TWO-CYCLE DIESEL MARINE ENGINES

Manufactured by

SULZER FRÈRES, Winterthur, Switzerland

Builders of the Largest Experimental Diesel Engine, Developing 2500 I.H.P. in One Cylinder



Sulzer 1500 Shaft H.P. Diesel Marine Engine

Prominent Advantages of TWO-CYCLE ENGINES as compared with FOUR-CYCLE ENGINES

SAVING OF SPACE
The engine room of two-cycle engines is 25-30% shorter than the engine room of four-cycle engines of equal capacity,

SAVING IN COST OF FUEL
Topped crude oils are used in two-cycle engines, whereas four-cycle engines are using more expensive distillates.

SAVING IN UPKEEP AND REPAIR WORK—GREATER RELIABILITY
The absence of suction valves and exhaust valves and the simplicity of the reverse gear in two-cycle engines increase their reliability and greatly facilitate their attendance.

BUSCH-SULZER BROS. DIESEL ENGINE CO.
ST. LOUIS, MO.

Sole Owners of All Rights for Sale and Manufacture of Sulzer Diesel Engines for Installation in the U. S. A. and Its Possessions; Panama and Canada

EASTERN SALES OFFICE
60 BROADWAY, NEW YORK

WINTERTHUR, SWITZERLAND.

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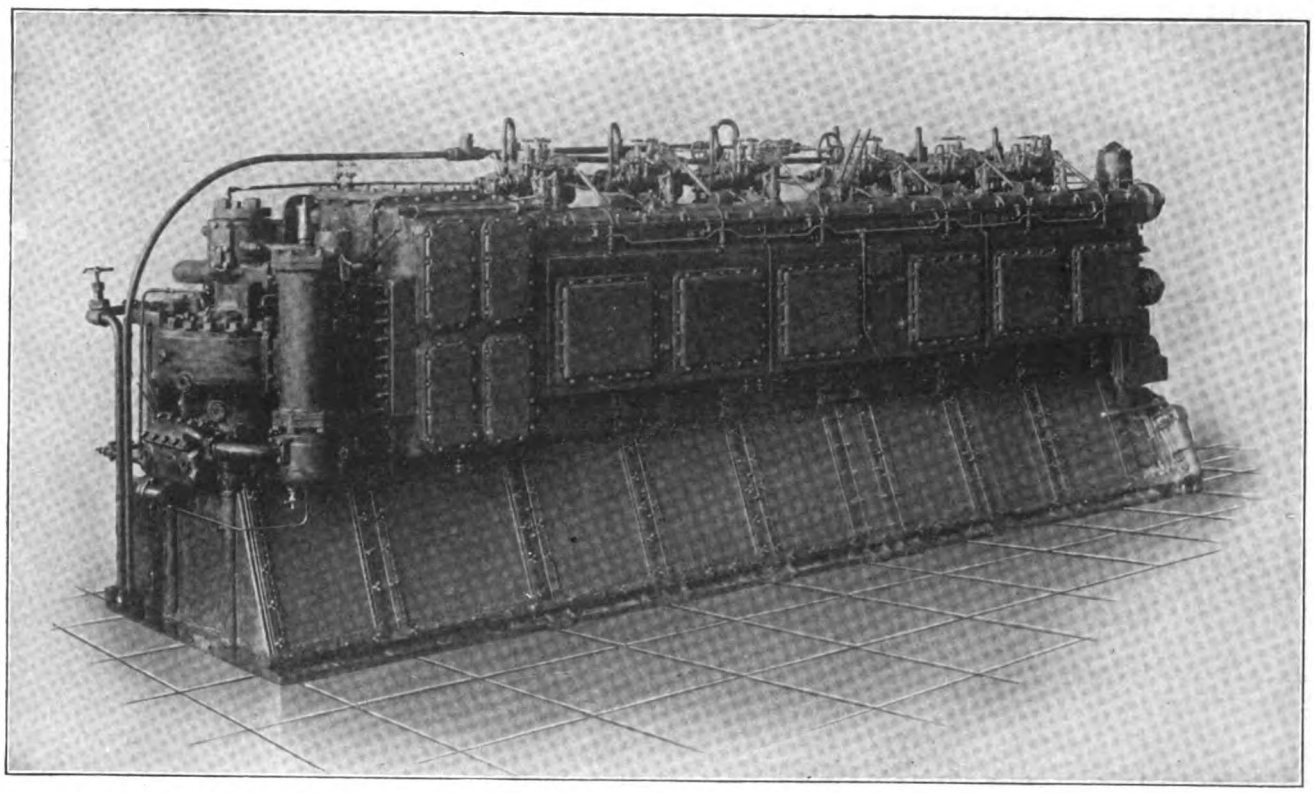
BUSCH-SULZER-DIESEL

STATIONARY AND MARINE
DIESEL OIL ENGINES



The above picture shows one of our Special, High-Speed Light-weight, Two-cycle, Marine Diesel Engines, having a capacity of 1000 B.H.P., at 360 R.P.M., and weighing 50 pounds per B.H.P.

We build, also, Slow-speed Marine Diesel Engines, from 500 to 3000 B.H.P., and Stationary Diesel Engines, from 120 to 2000 B.H.P.

Subject to prior sale, we can offer prompt shipment of Stationary Diesel Engines of 120, 165, 250, 365 and 520 B.H.P., suitable for transmission or direct connection.

DESIGNERS AND BUILDERS OF DIESEL ENGINES SINCE 1898.

Owners of all Diesel Engine Rights and Experiences in and for the U. S. A. and its Possessions; Panama and Canada; of the Diesel Motor Company of America; the American Diesel Engine Company; Sulzer Freres of Winterthur, Switzerland; Rudolf Diesel, Inventor of the Engine.

BUSCH-SULZER BROS.-DIESEL ENGINE CO.
ST. LOUIS, U. S. A.

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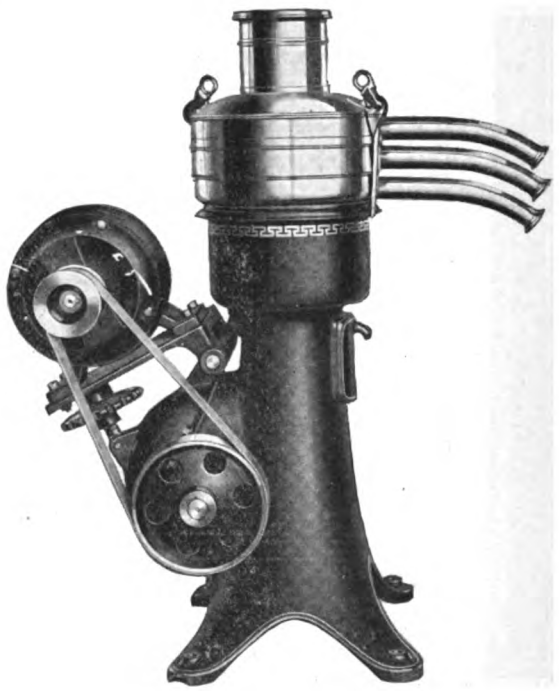
THE DE LAVAL OIL PURIFIER

The De Laval Oil Purifier effects a great economy in machinery repairs by effectively keeping grit, dirt, water and carbon out of the lubricating system. It eliminates premature destruction of cylinders, bearings, pumps and all other moving parts, which would be rapidly destroyed if the impurities were allowed to remain in the oil. Less power is consumed because of more perfect lubrication.

The De Laval Oil Purifier also insures a substantial economy of oil because the dirty oil is not pumped overboard, but is returned to its original lubricating qualities each time it is purified, and used over and over again. Considerably less oil is carried when the De Laval Oil Purifier is used, which means economy of oil storage space and the tying up of less capital in oil.

The Oil Purifier is economical in space and power, requiring less than two square feet of space and from one-half to two H.P. to drive, according to size.

Write to nearest sales headquarters for Crank Case Oil Bulletin No. 102, and also for Marine Bulletin No. 103.



DE LAVAL OIL PURIFIER
Electric Driven

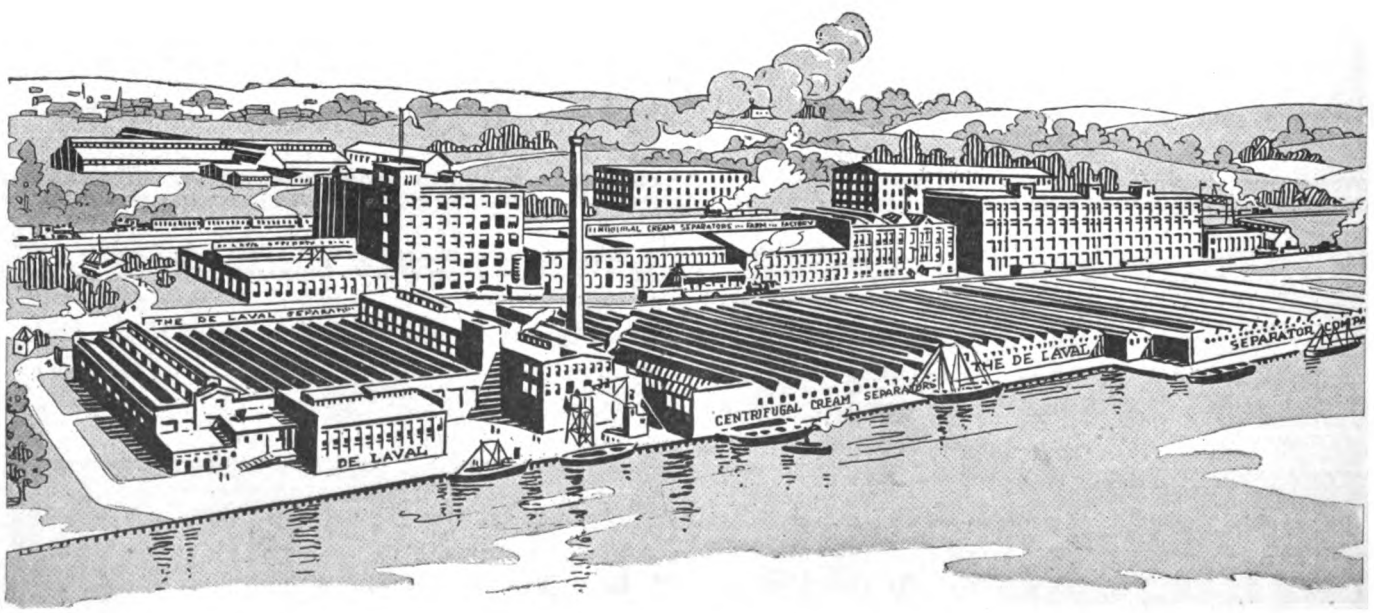
THE DE LAVAL SEPARATOR CO.

Largest Manufacturers of Centrifugal Machinery in the World

165 Broadway, New York **29 East Madison St., Chicago**

Manufacturers' Selling Agents

De Laval Dairy Supply Co.
San Francisco, Cal.



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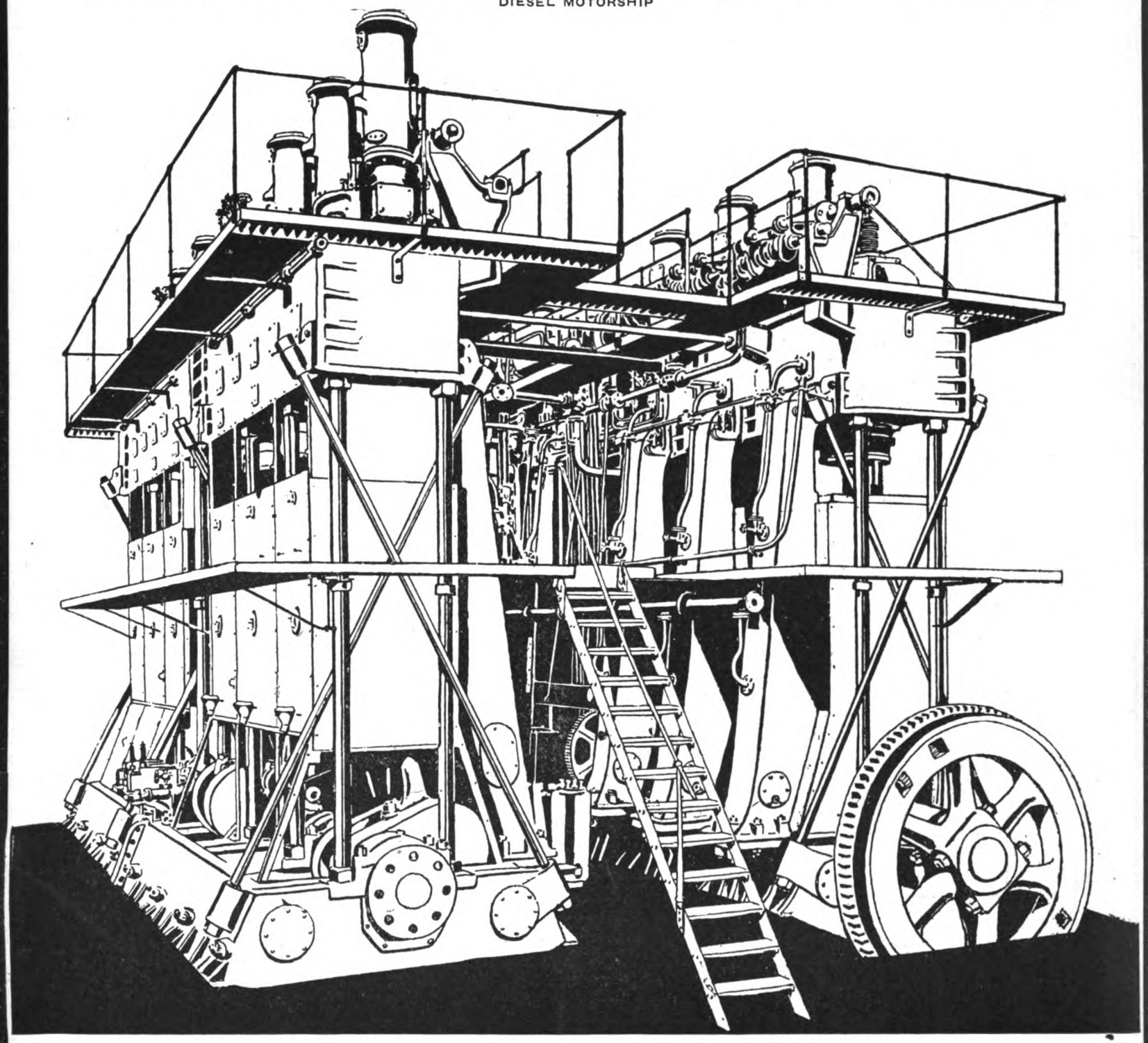
AMSTERDAM **WERKSPOOR** HOLLAND

NOW UNDER CONSTRUCTION

Twin-screw Sets 1000 I. H. P. to 4250 I. H. P. for Cargo Ships

THE FIRST DIESEL ENGINE WITH CROSSHEADS AND GUIDES WAS BUILT BY WERKSPOOR—A PRACTICE NOW ADOPTED BY ALL LEADING BUILDERS. WERKSPOOR ALSO BUILT THE ENGINES OF THE FIRST OCEAN-GOING FULL-POWERED DIESEL MOTORSHIP



A 4300 I.H.P. WERKSPOOR MERCHANT SHIP DIESEL PROPELLING SET

Illustrating the combination of vertical and diagonal steel columns and cast-iron columns which form prominent features of the Werkspoor design. Additional rigidity is obtained by bracing the two engines together. Some of the oil-tight splash-plates are shown removed to denote accessibility.

FOUR CONSTRUCTIONAL LICENSEES IN THE U. S. A.

DIESEL MARINE ENGINES

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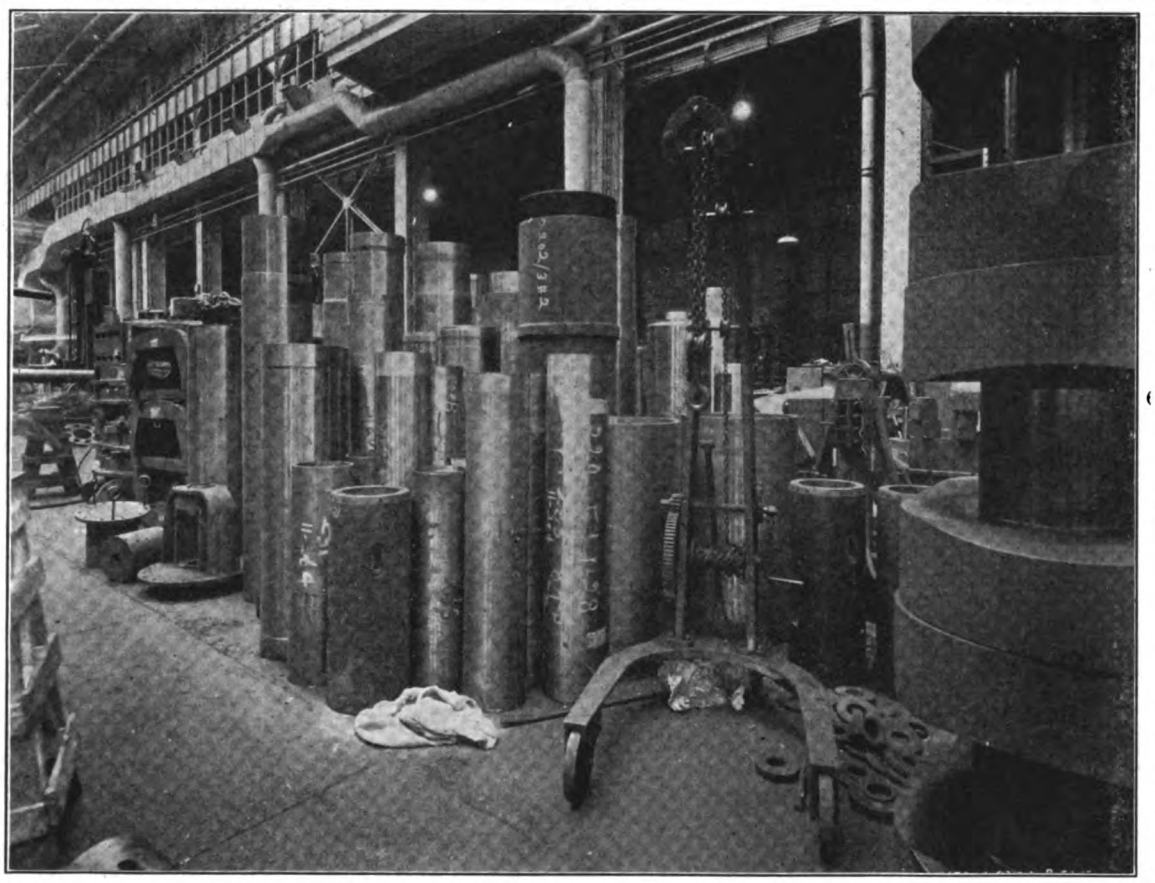
CRAMP

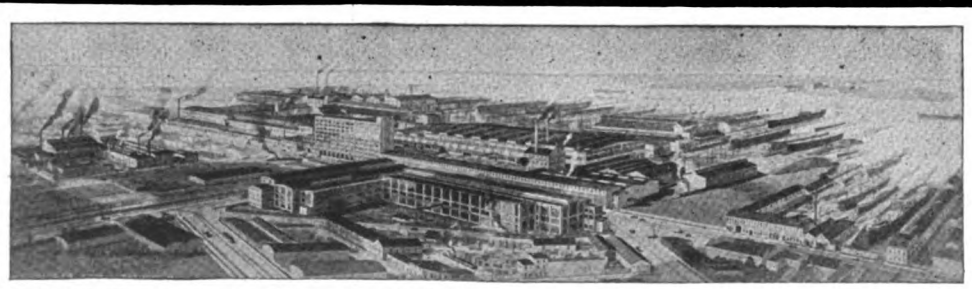
The Photograph Below Shows a Group of Propeller Shaft and Stern Tube Shaft Sleeves of Composition "G"

68 of these sleeves weighing over 100,000 lbs., varying in diameters from 16 in. to 18 in. and in lengths from 12 ft. to 16 ft., and varying in weight from 1600 to 3300 lbs. each, have recently been cast by us without a flaw developing in the machining of any one of them.

We are in position to make prompt shipment of similar sleeves of any diameter and any length up to 16 ft., no patterns being necessary.

THE WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., Phila.





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ROBERT HASLER & CO., INC.

STEAMSHIP AGENTS

Personal attention given to Agency business. Quickest despatch assured.
Owner's interests carefully protected.

AGENTS FOR

ALL LEADING AMERICAN STEAMSHIP HOUSES

BUNKER CONTRACTORS

Highest Grade NEW RIVER and POCOHONTAS Steam Coal from Selected Mines

COALING PIERS: NORFOLK { Lamberts Point / Sewalls Point
NEWPORT NEWS

CABLE ADDRESS "RELSAH" NORFOLK, VA.

NORFOLK SEABOARD BANK BLDG. BRANCH OFFICE: NEWPORT NEWS VA.

THE NEW YORK SHIPBUILDING CORPORATION, OF CAMDEN, WHO ARE LICENSED TO BUILD WERKSPOOR DIESEL ENGINES, WILL NOT BE ABLE TO CONTRACT, AT PRESENT, FOR THESE ENGINES, OWING TO THE AMOUNT OF OTHER WORK WHICH OBLIGES THEM TO INCREASE THEIR PRESENT FORCE.

THE NEW YORK SHIPBUILDING CORPORATION

MAIN OFFICE AND WORKS

CAMDEN, NEW JERSEY

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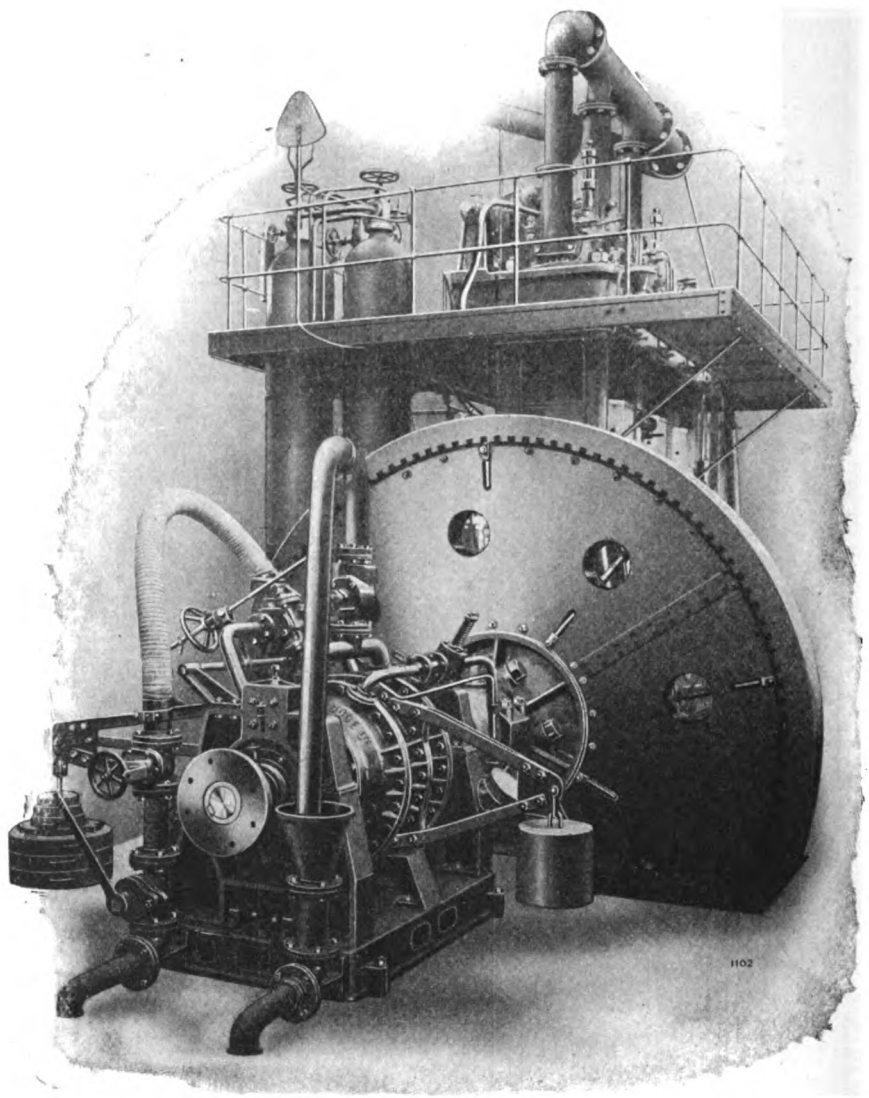
FROUDE DYNAMOMETER

THE STANDARD TESTING INSTRUMENT OF THE BRITISH ADMIRALTY

Froude Dynamometers are scientifically designed for rapidly ascertaining the *exact* B.H.P. of any description of engine. Machines in hand capable of absorbing up to 4,000 B. H. P. at a speed of 70 R. P. M.

FROUDE Dynamometers are being used by the McIntosh & Seymour Corporation, Auburn, N.Y., and by the Skandia Pacific Oil Engine Co., Oakland, Cal., for testing Diesel Engines for the U. S. Shipping Board, Emergency Fleet Corporation's Motorships. Also by Messrs. The Fore River Shipbuilding Co., Quincy, Mass.; Messrs. Fulton Iron Works, and Joseph Tracey, Esq., Consulting Engineer, New York City.



Froude Dynamometer testing Diesel Engine

By aid of the "Froude" Dynamometer, the mechanical efficiency of an engine can be accurately determined, and further improvements introduced for *raising* that efficiency.

FULL PARTICULARS AND PRICES FROM

HEENAN & FROUDE, LTD. WORCESTER, ENGLAND

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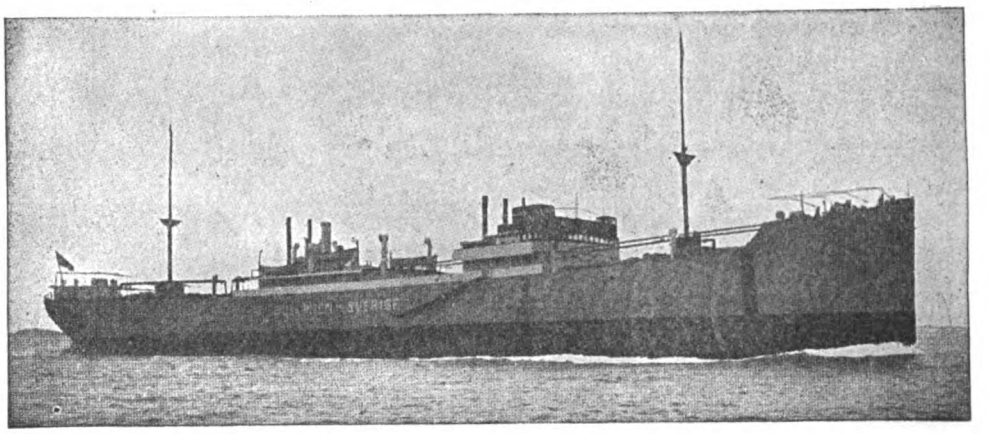
Uniflex Couplings

"WHEREVER SHAFTS MEET"

FOR USE ON



Swedish motorship "Bullaren" equipped throughout with electric auxiliary drive. A flexible coupling is used on every machine aboard.

MOTORSHIPS

SET NEW STANDARDS

BECAUSE they are absolutely impervious to moisture under any and all conditions.

BECAUSE They require no lubrication.

BECAUSE they are indestructible and guaranteed for the life of the installation.

BECAUSE They are designed in many different styles and are so designed that they can be removed without moving the shafts or the machine.

BECAUSE mechanically they are 100% efficient and are absolutely noiseless.

BECAUSE they act perfectly on reverse with heavy load.

BECAUSE regardless of speed Uniflex couplings will carry more torque than any other design at present on the market.

Uniflex couplings are recommended for all main and auxiliary drives for shafts from ¾" to 16½" diameter.

OUR DESIGNING STAFF WILL GLADLY ASSIST IN SOLVING YOUR COUPLING PROBLEMS. WRITE US.

UNIFLEX COUPLING COMPANY,
DISTRIBUTORS
Lafayette Bldg.
PHILADELPHIA, PENNSYLVANIA

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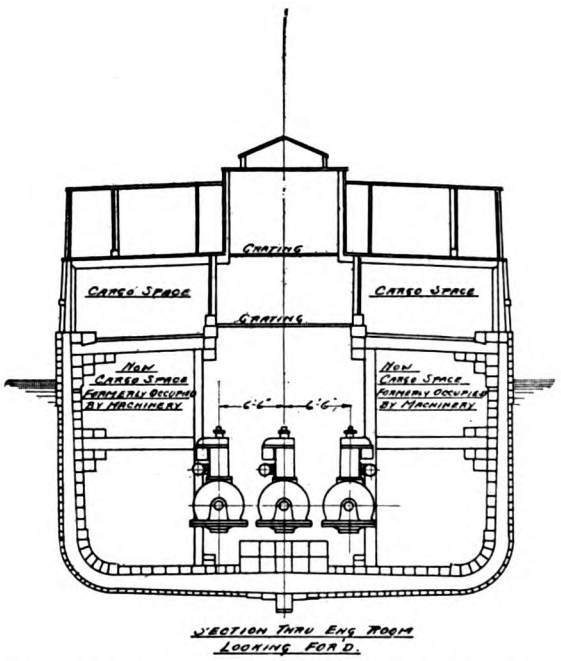
Win

OIL Diesel Type

THE small Wooden Cargo Carrier need not be discarded and turned into a barge or a sailing ship.

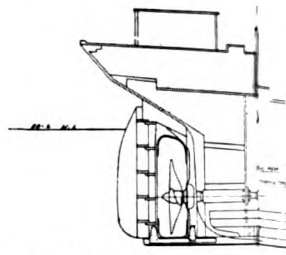
The Winton Engineers have thought out and worked out a plan which turns these boats into efficient, economical Cargo Carriers at a comparatively small expense.

The plan, in substance, is to remove from these wooden ships the reciprocating engines and other steam equipment now installed in them, replacing these power units with Diesel Engines direct connected to Electric Generators which will furnish power to a motor placed directly inside of the stern, which in turn is connected to the propeller.

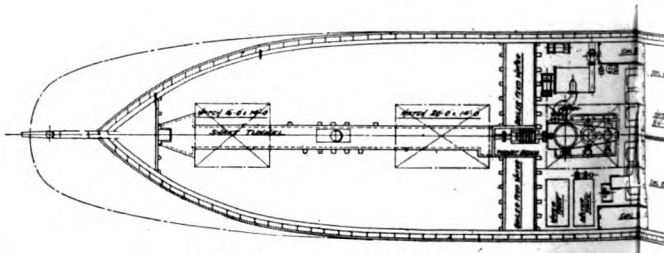


ENGINE ROOM SECTION LOOKING FORWARD

The plans also provide for the installation of two 50 K.W. four-cylinder Winton Oil Engine generating sets. The 100 K.W. thus made available is to be used for heating, lighting, operating pumps of all kinds and also for cooking by electricity. For loading or unloading both these Auxiliary Sets are available for use, or, if insufficient for the purpose, one of the main units may be started and used to generate power for this purpose.



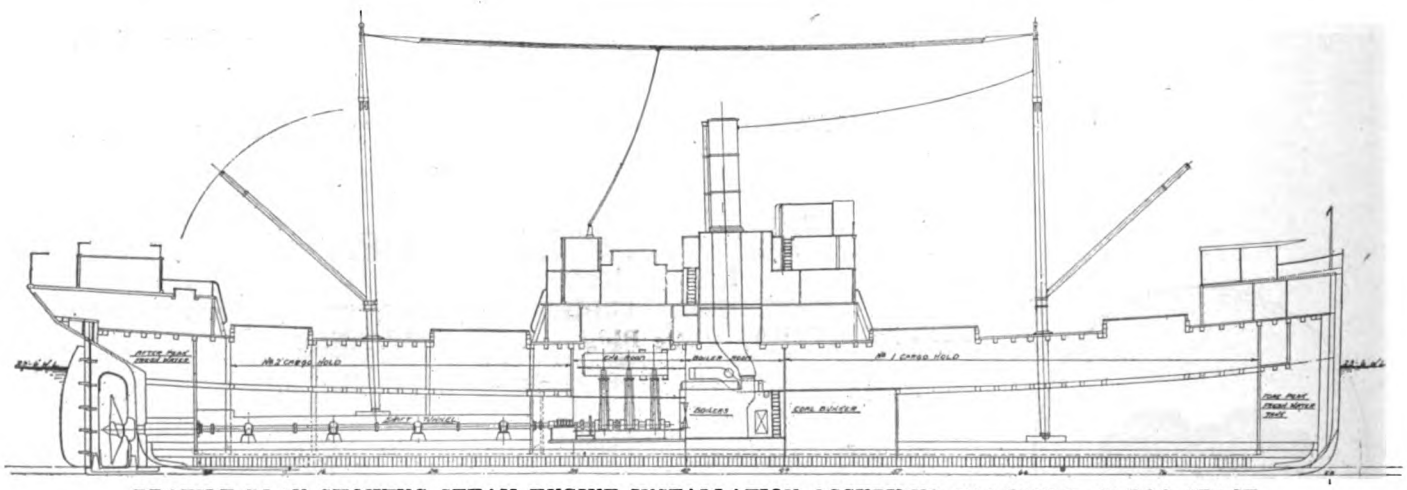
DRIVING MOTOR CONN



PRESENT ARRANGEMENT OF MACHINERY

WINTON ENGINE WORKS

Eastern Sales Office: Rost, Angstman & Griese
1778 Broadway, New York City



PROFILE PLAN SHOWING STEAM ENGINE INSTALLATION OCCUPYING VALUABLE CARGO SPACE

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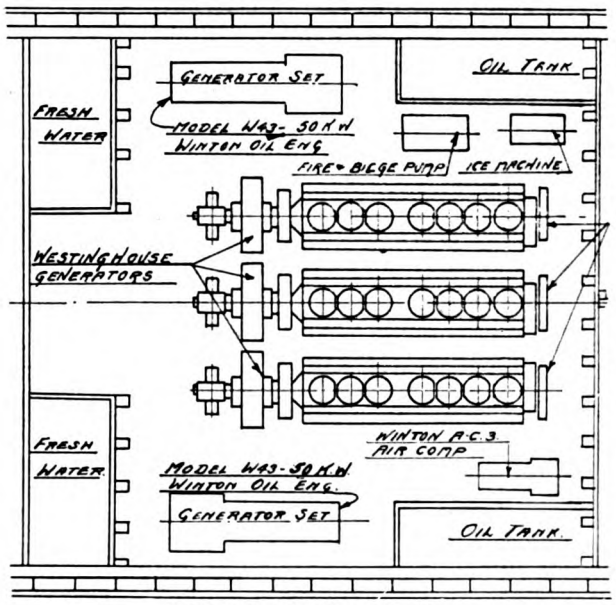
ton

NGINES

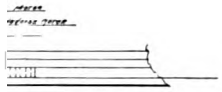
THIS plan revolutionizes the carrying capacity and the economy of these wooden ships. It increases the cargo carrying capacity by at least 500 tons and decreases operating costs by better than 50%.

The additional cargo carrying capacity is secured by the elimination in its entirety of the propeller shaft tunnel, coal bunkers, boiler room, etc.

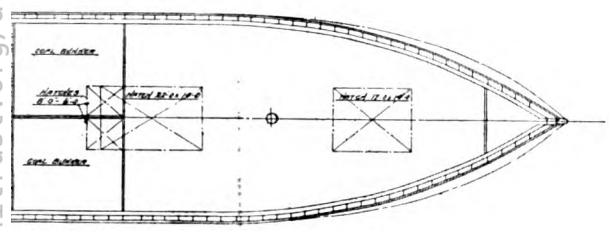
Plans shown herewith illustrate the present steam engine installation AND show the difference obtained by installing three Winton Oil Engines direct connected to generators and, in turn, operating a driving motor in the stern.



ENGINE ROOM LAYOUT



TO PROPELLER



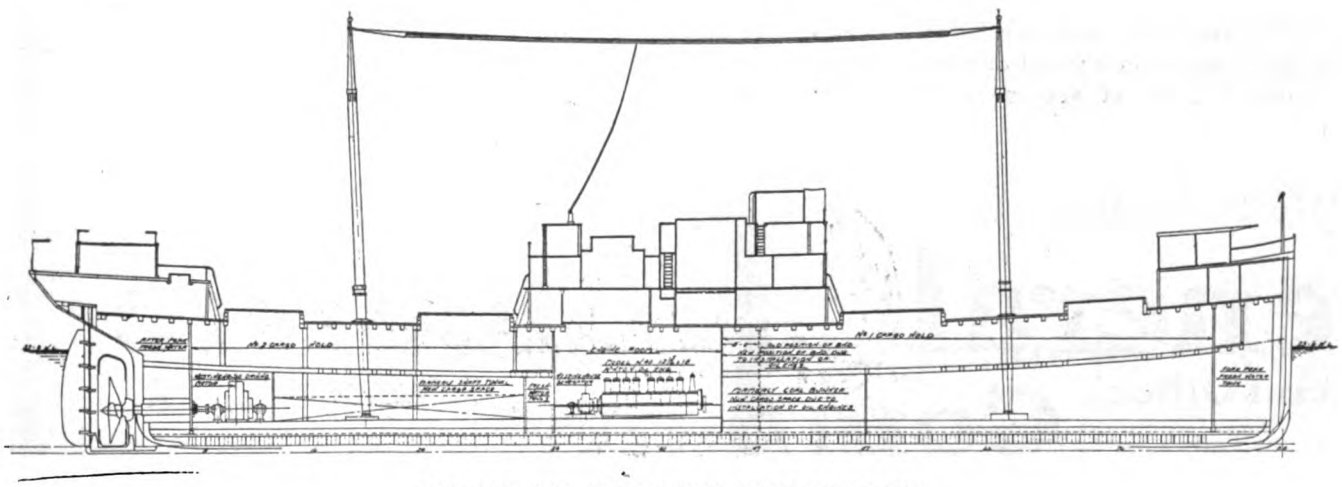
UPYING VALUABLE CARGO SPACE

The use of three Winton Oil Engines has the added advantage of freedom from complete power plant breakdown. One engine may be stopped for adjustment or repair, yet the speed of the ship will be only slightly impaired, as the remaining two engines will still be in operation.

This plan is the answer to a hitherto unsolved problem. It will pay you to investigate the details of this plan. Write or telegraph to-day for descriptive bulletin.

CLEVELAND, OHIO, U. S. A.

Western Sales Office: H. W. Starrett
Sunset Engine Company, Seattle, Washington



PROFILE SECTION WITH ELECTRIC DRIVE

© 1919. Rex W. Wadman, Inc.

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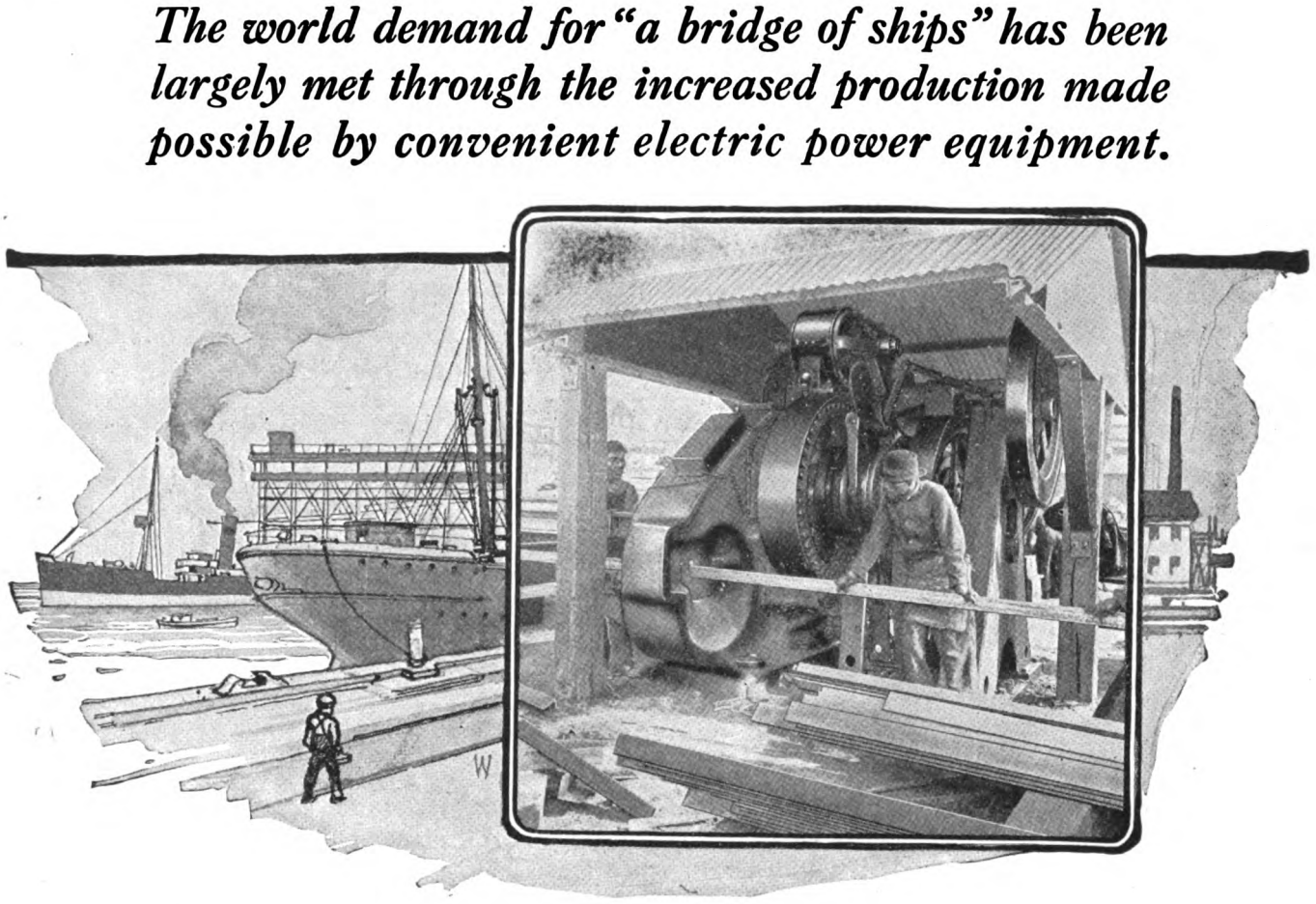
The world demand for "a bridge of ships" has been largely met through the increased production made possible by convenient electric power equipment.



Speeding Shipbuilding Electrically

THE nation's need was speed. Shipyards must produce to capacity. Machinery was rushed into place and immediately driven by electric motors—often before the surrounding building was finished—so production was enabled to start promptly through electricity's aid.

The machinery was operated at its maximum productive speed or through a required cycle of speeds by thoroughly dependable G-E motors and control equipments. Night-time operations were conducted at practically day-time efficiency by G-E electric lighting systems which included flood light projection and exterior police lighting as well as expertly arranged interior lighting.

Our experts will be pleased to work with you to select or design suitable electrical equipment for your shipyards.

43-308

General Electric Company

General Office Schenectady, N.Y.

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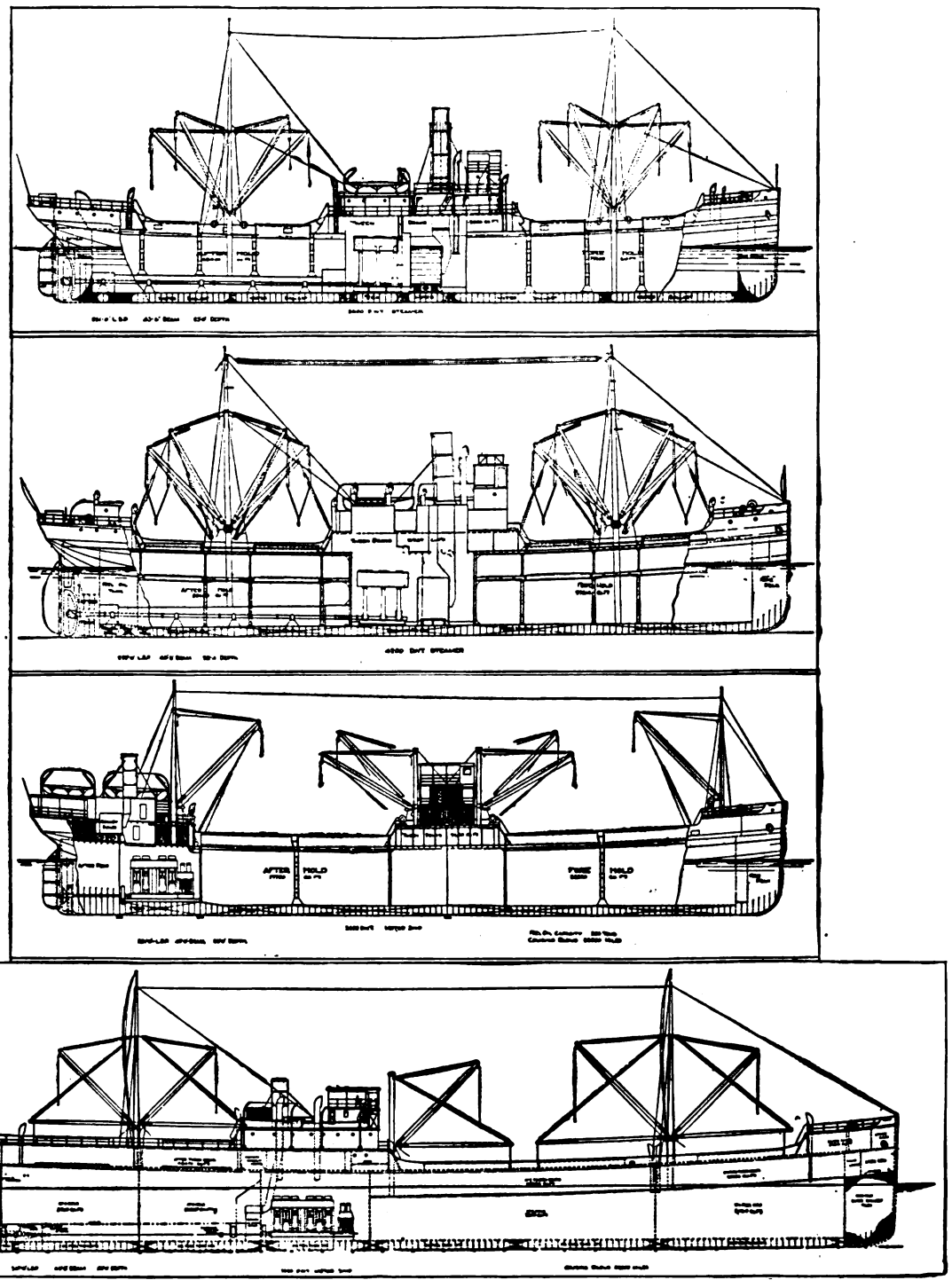
Manitowoc Shipbuilding Co.



Standard ocean-going steam and motor ships.

Designers and builders of steel vessels, marine engines, boilers, ship auxiliary machinery, etc.

Manitowoc, Wisconsin

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HEAVY OIL-ENGINE FORGINGS

View in main bay of Forge Shop. We have three huge steam hydraulic presses. Twenty heating furnaces and six overhead travelling cranes in this bay.

Pacific Construction AND Engineering Co.

2917 Whatcom Avenue — Robt. C. Monteagle, *President and General Manager* — Seattle, U. S. A.

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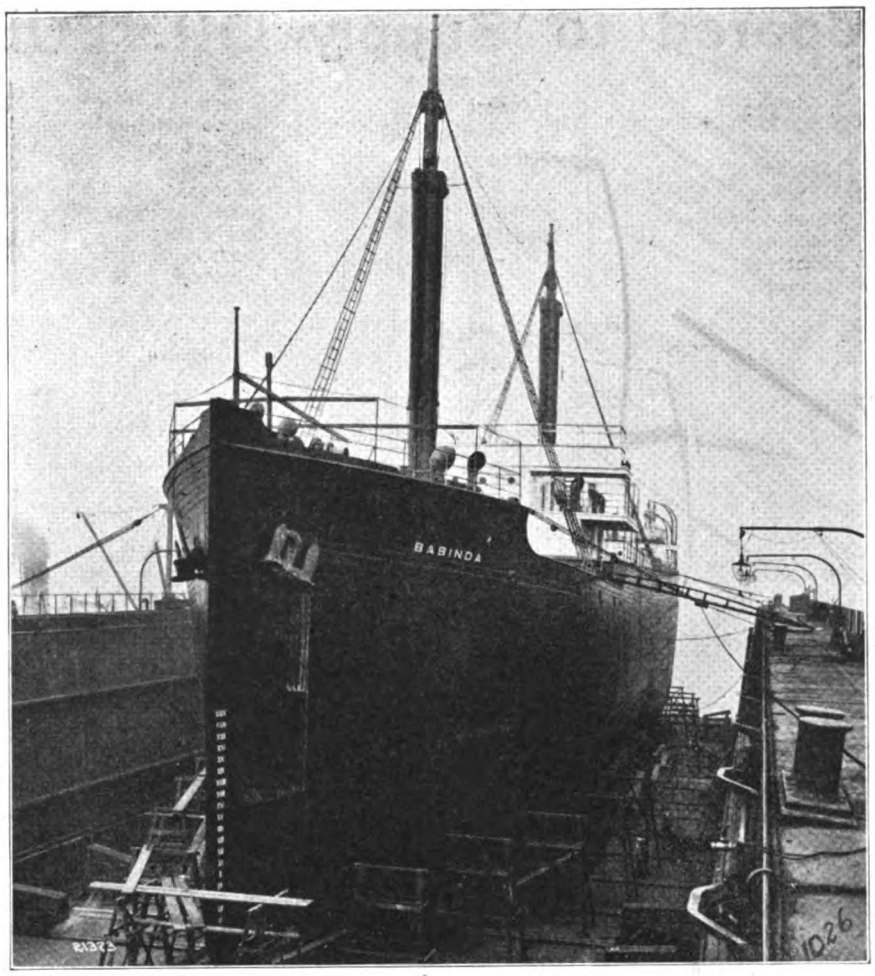
McINTOSH & SEYMOUR

HEAVY OIL

ENGINES

Twenty years Diesel engine experience, both stationary and marine, of our Swedish works and thirty-three years experience on steam and Diesel engines in our works, with our well trained organization and completely equipped works insure the best Diesel type engines available today.



The "Babinda" was originally arranged for steam but was changed to McIntosh & Seymour Diesel type marine engines, due to the good service of the engines on the first four motorships owned by the Australian Government.

Motorship "Babinda" in dry dock being calked before leaving the Pacific Coast for the Far East

The Motorship "BABINDA" and her eight sister ships of the Australian Commonwealth Government Line are each equipped with pairs of 640 I.H.P. McINTOSH & SEYMOUR Diesel Type Marine Engines. The first four of these vessels have been in regular service between this country and Australia for over a year.

Vessel owners are cordially invited to inspect our facilities.

McINTOSH & SEYMOUR CORPORATION

149 BROADWAY
NEW YORK CITY

MAIN OFFICE AND WORKS
AUBURN N.Y.

815 SHELDON BLDG.
SAN FRANCISCO CAL

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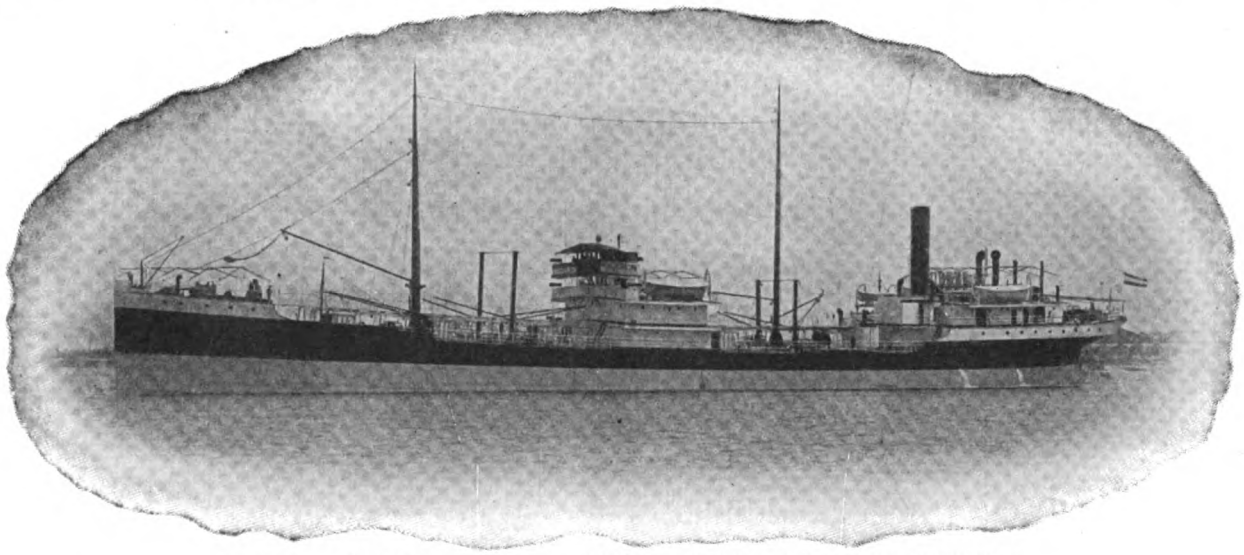
OIL FUEL

THE FUEL OF THE 20th CENTURY

The Asiatic Petroleum Co., Ltd.

are prepared to Supply OIL FUEL at

Adelaide
Alexandria
Balik Pappan
Bangkok
Batavia
Bombay
Calcutta
Cape Town
Colombo
Curacoa
Hong Kong
Karachi
La Guayra
Lisbon
Madras
Maracaibo
Melbourne
Montreal
Nagasaki
Palembang
Panama Canal (both ends)
Pangkalan Berandan
Penang
Portland Oregon, U. S. A.
Port Said
Puerto Cabello
Puloe Samboe
Rotterdam
Sabang
Saitozaki
San Francisco
San Pedro
Seattle, Washington, U. S. A.
Shanghai
Singapore
Soerabaya
Suez
Sydney
Tampico
Tarakan
Thameshaven
Trinidad
Vancouver



ONE OF OUR FLEET OF OIL-CARRYING DIESEL-ENGINED MOTORSHIPS

Note.—During the war it is not possible to keep stocks at some of the above-named ports. It is therefore advisable for intending buyers to enquire whether stocks are available.

Buyers desiring information regarding supplies of and prices for **OIL FUEL** for use in Internal-combustion Engines or for other purposes should apply to **THE ASIATIC PETROLEUM COMPANY, LIMITED**, at the above address.

The Asiatic Petroleum Company also supply **KEROSENE OIL** for use in the smaller Internal-combustion Engines and are prepared to supply **PETROLEUM SPIRITS, LUBRICATING OILS, WAX** and **GREASES** in all far Eastern Markets.

NEW YORK AGENTS—The New Orleans Refining Company, 233 Broadway, New York, U. S. A.

SAN FRANCISCO AGENTS—The Shell Co. of California, Security Building, 343 Sansome Street, San Francisco.

THE ASIATIC PETROLEUM CO., LTD.

ST. HELEN'S COURT, GREAT ST. HELENS
LONDON, E. C., ENGLAND

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Worthington Pumps *for* Motor Ships

MANY different kinds of pumps are needed for the various conditions of service on motor ships. Worthington pumps not only meet every requirement, but in most cases offer a choice of several types.

On the "Mt. Hamilton," a four masted motor-schooner, the auxiliary fire and bilge pump is a 7½″ x 5″ x 6″ Worthington Duplex which may be driven either by steam from the donkey boiler or by air from the main compressor. It is also connected so as to deliver circulating water to the main engines. The oil trimming pump is also a Worthington 5¼″ x 4¾″ x 5″ duplex.

In the steam ship field Worthington products range from the smallest pump to the largest marine engines.

The record established by Worthington products throughout the U. S. Navy for efficiency and durability during war-time, supply a chapter in marine development which every naval engineer should know.

We will be glad to supply particulars as to specification details, deliveries, operating records or prices.

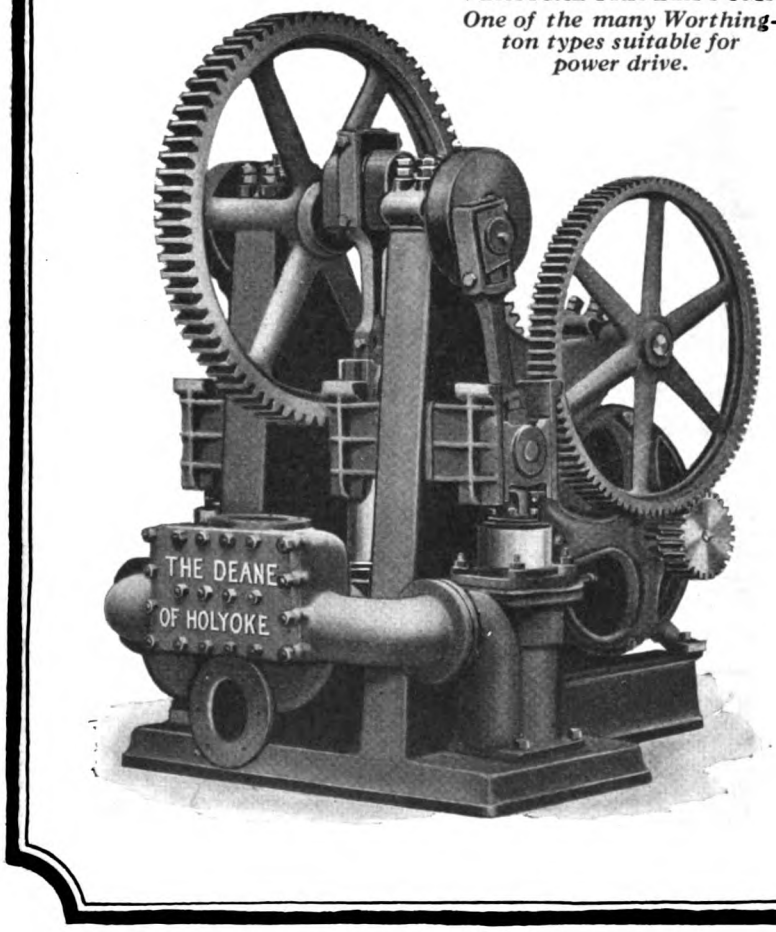
Worthington Pump and Machinery Corporation

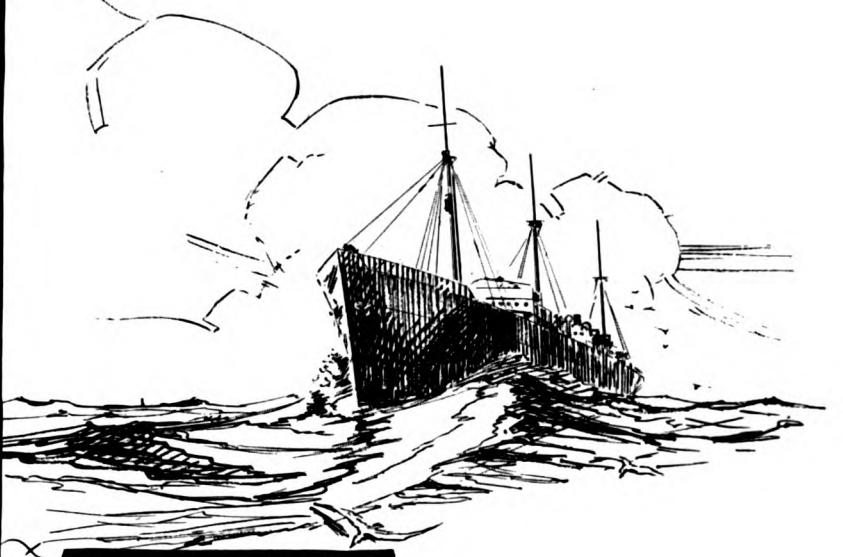
Executive Offices: **115 Broadway, New York City**

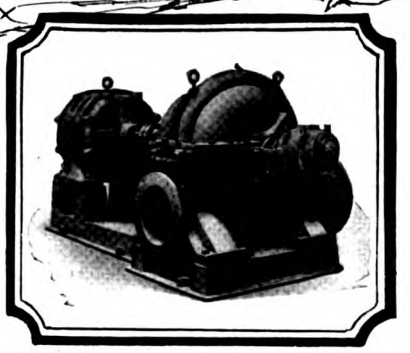
Branch Offices in 24 Large Cities

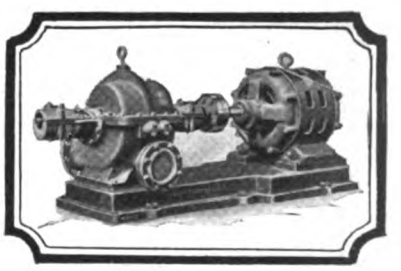
VERTICAL TRIPLEX PUMP

One of the many Worthington types suitable for power drive.









PUMPS—COMPRESSORS—CONDENSERS—OIL & GAS ENGINES—METERS—MINING—ROCK CRUSHING & CEMENT MACHINERY

WORTHINGTON

Deane Works, *Holyoke, Mass.*
Blake & Knowles Works *East Cambridge, Mass.*
Worthington Works *Harrison, N. J.*
Hazleton Works, *Hazleton, Pa.*
Laidlaw Works, *Cincinnati, Ohio*
Gas Engine Works, *Cudahy, Wis.*
Power & Mining Works *Cudahy, Wis.*
Snow-Holly Works *Buffalo, N. Y.*

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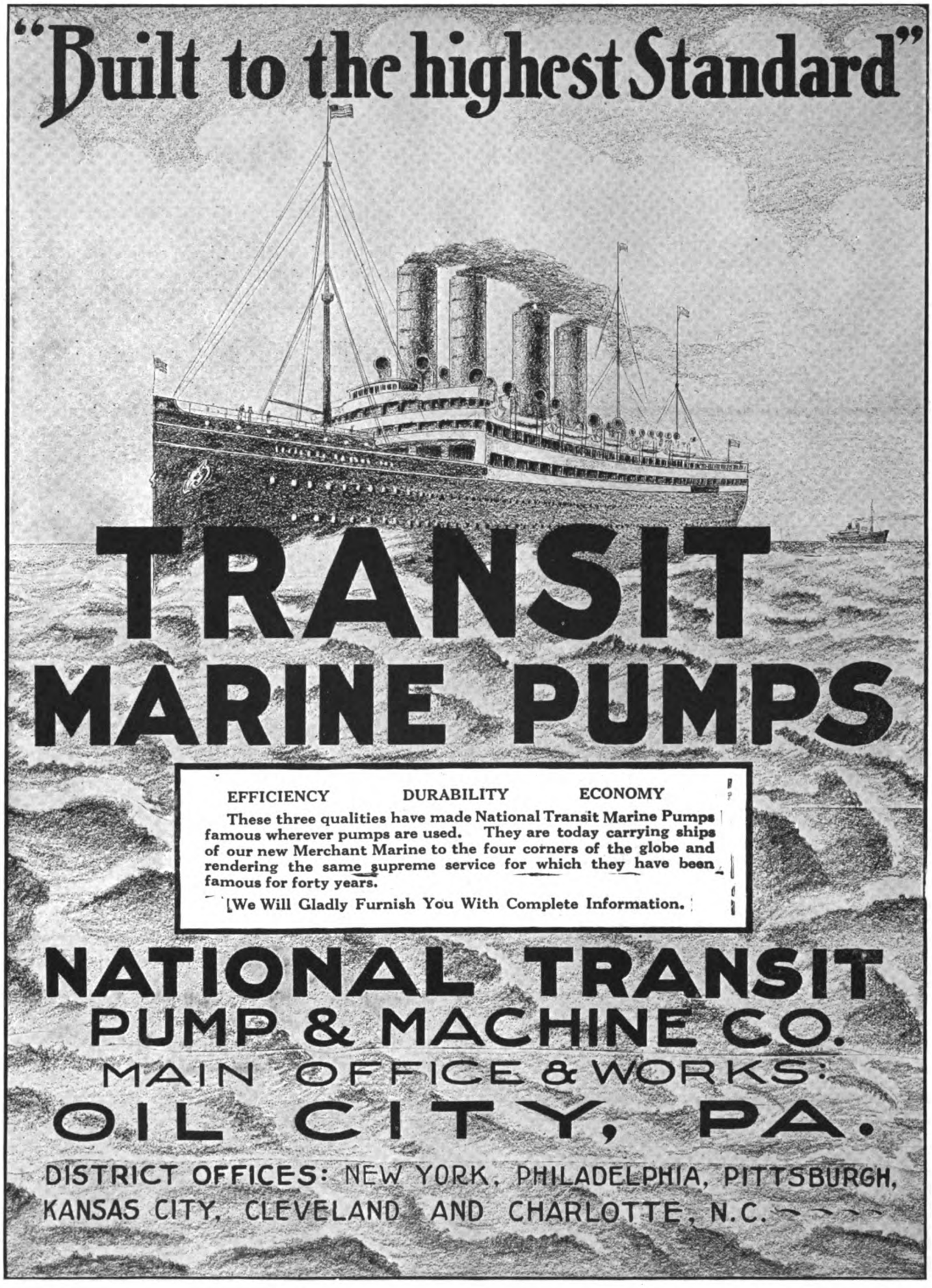
"Built to the highest Standard"
TRANSIT
MARINE PUMPS
EFFICIENCY DURABILITY ECONOMY
These three qualities have made National Transit Marine Pumps famous wherever pumps are used. They are today carrying ships of our new Merchant Marine to the four corners of the globe and rendering the same supreme service for which they have been famous for forty years.
[We Will Gladly Furnish You With Complete Information.
NATIONAL TRANSIT
PUMP & MACHINE CO.
MAIN OFFICE & WORKS:
OIL CITY, PA.
DISTRICT OFFICES: NEW YORK, PHILADELPHIA, PITTSBURGH,
KANSAS CITY, CLEVELAND AND CHARLOTTE, N.C.

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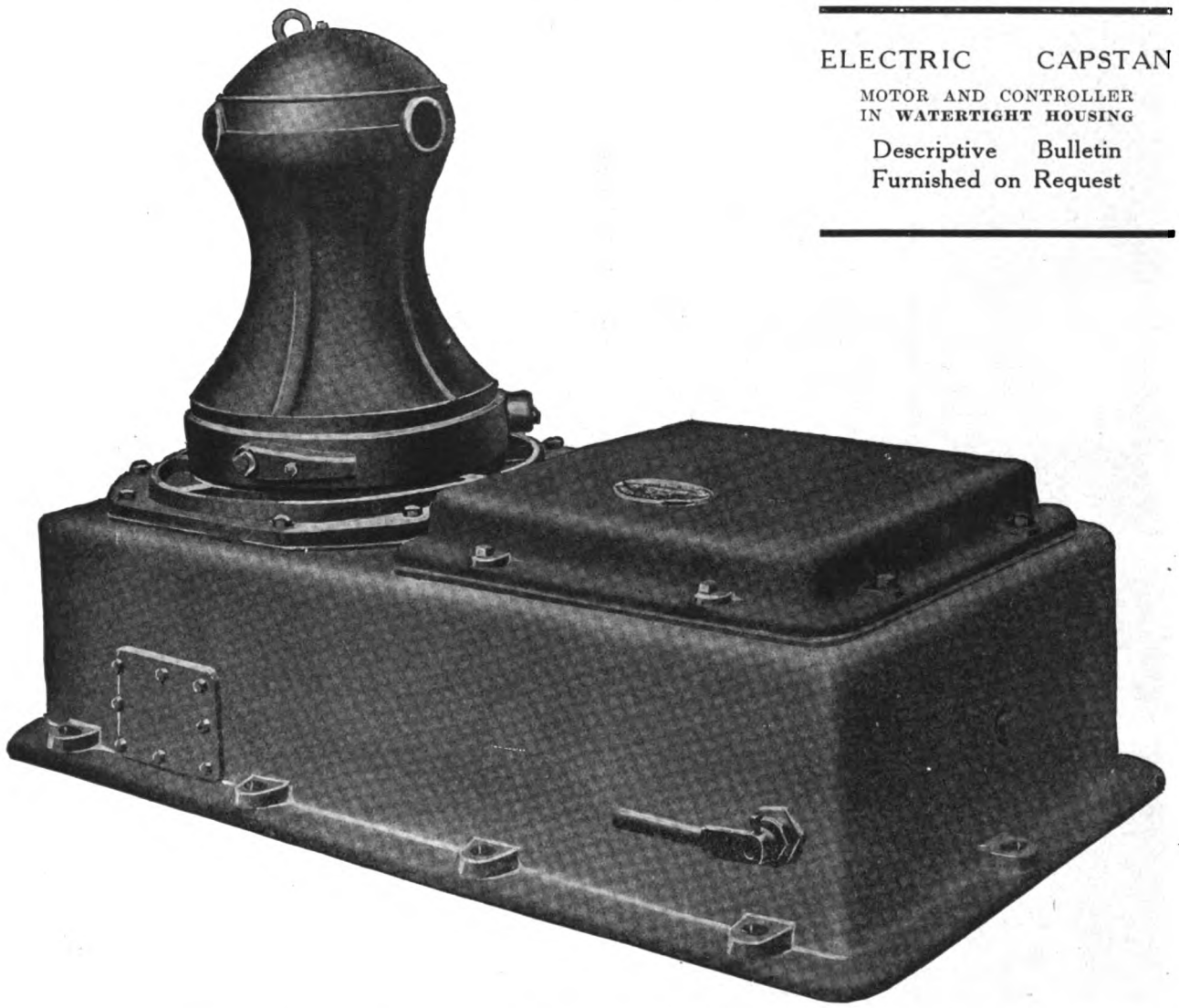
Marine Electric Equipment

for Motorships, Steamships, Barges, Sailing Vessels

5746 B. H. P. INSTALLED IN WORLD FAMOUS SHIPS



ELECTRIC CAPSTAN

MOTOR AND CONTROLLER
IN WATERTIGHT HOUSING

Descriptive Bulletin
Furnished on Request

BUILT TO STAND MARINE SERVICE

Anchor Windlasses—Cargo Winches (One Man Control)
—Capstans—Steering Gears—Telemotors—Switch-Boards
—Generating Sets—Etc.

Pacific Machine Shop & Mfg. Co.

STEAM AND ELECTRIC MARINE ENGINEERS

MAIN OFFICE AND WORKS: SEATTLE, U. S. A.

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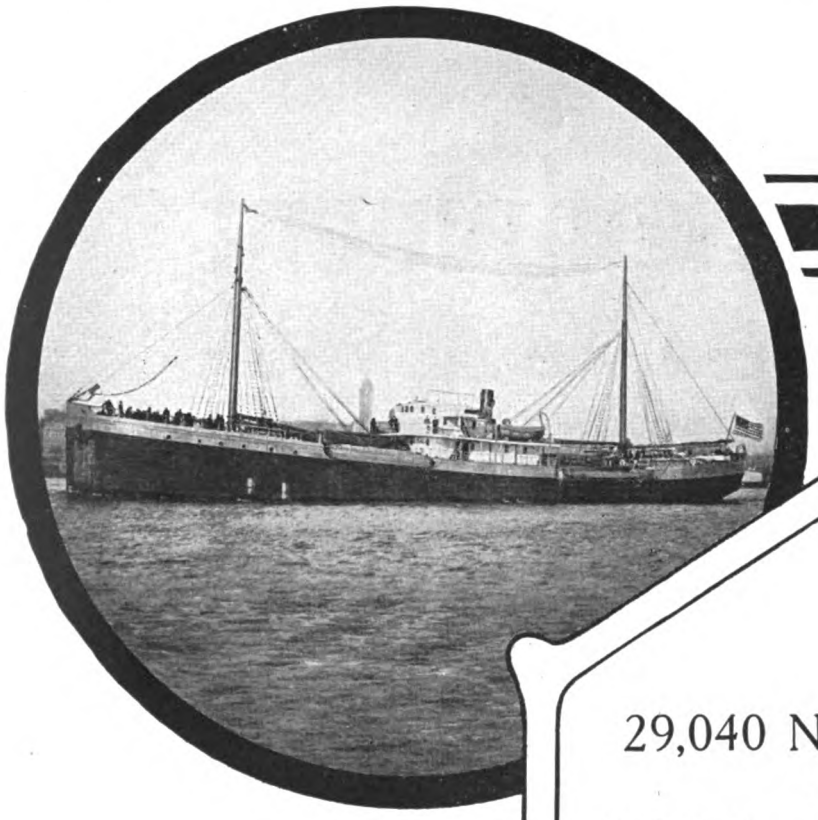


The Full Powered Motorship

"LIBBY MAINE"

Powered with 2-320 B. H. P.
Dow Motors

29,040 Nautical Miles

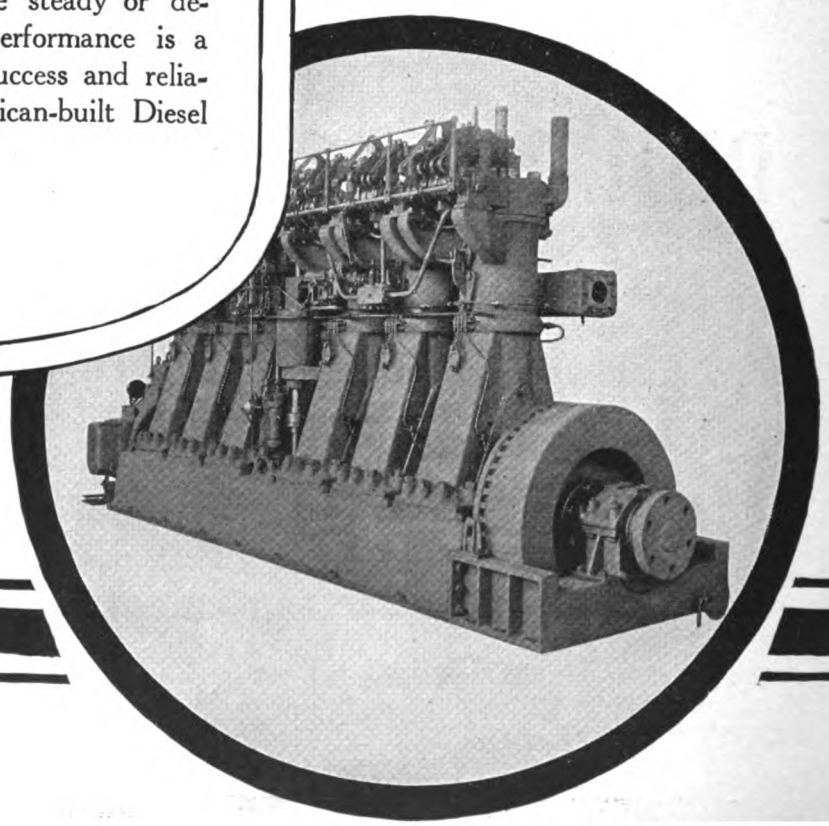
on

3,171 Barrels of Fuel Oil

or an Average of

17.4 Barrels Per Day

Since being launched in 1917, the "Libby Maine", powered with twin 320 h. p. Dow Diesel engines, has made ten successful cruises during which her power plant has made a performance that has been 100 per cent perfect and has established remarkable records for consistent running and great fuel economy. Tables are available showing her mileage, speed and fuel consumption. Her engineers and owners claim that no steam engines were ever more steady or dependable, and her performance is a great tribute to the success and reliability of the American-built Diesel engine.



THE DOW PUMP AND DIESEL ENGINE CO.
ALAMEDA, CALIFORNIA
PACIFIC NORTHWEST DISTRIBUTORS
PACIFIC NET & TWINE CO.
SEATTLE, WASH.

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TURBO GEAR
FAST PATENTS

Auxiliary Drives

Offer the following Advantages

1. Save floor space.
2. High efficiency.
3. Straight line drive.
4. Absolutely safe.
5. No vibration.
6. Reliability.
7. No noise.
8. Lighter weight per horsepower.
9. Low maintenance charges.
10. Low first cost.

Pumping Fuel Oil on Tank Ships

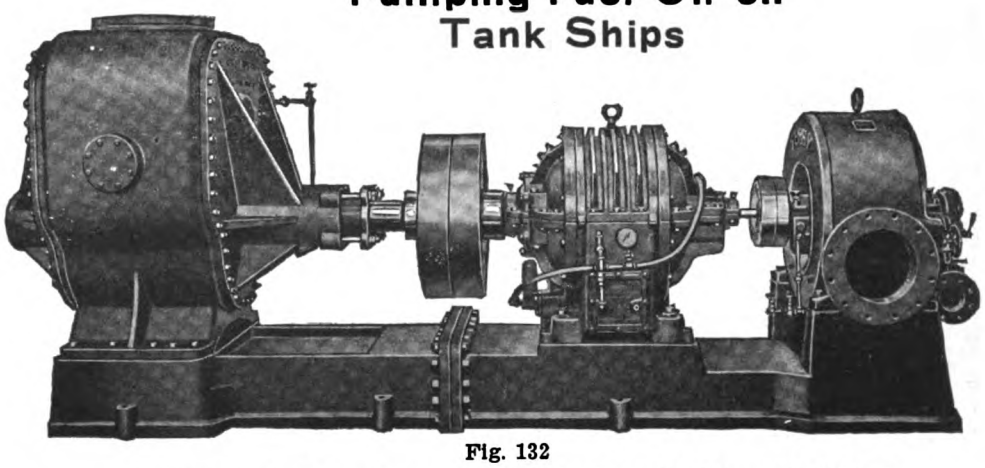
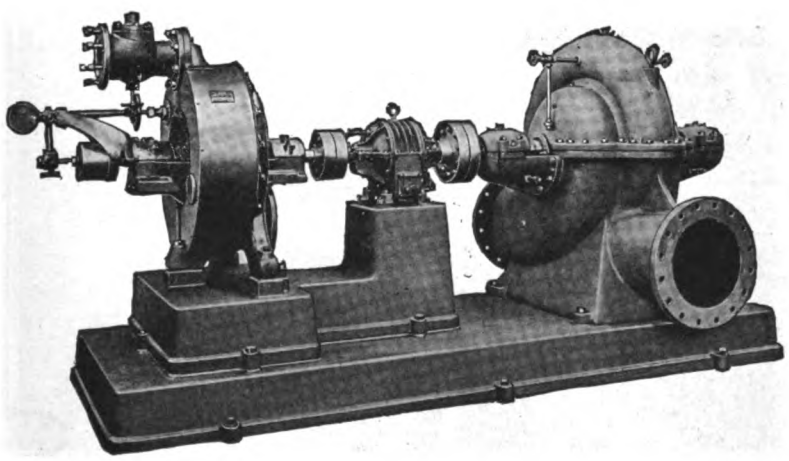


Fig. 132

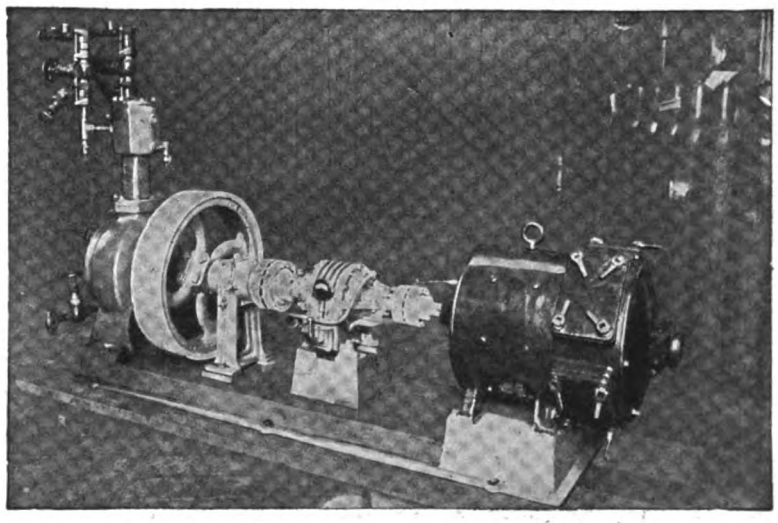
275 H. P. Turbo-Gear direct connected to Terry Turbine and driving 3000 G. P. M. Kinney Rotary Pump. Speed reduction 2400 to 206 R. P. M.

Circulating Pump Drive



85 H. P. Turbo-Gear direct connected to General Electric Turbine and driving a 5500 G. P. M. C. H. Wheeler Circulating Pump. Speed reduction 3000 to 670 R. P. M.

Refrigerating Drive



3 H. P. Turbo-Gear direct connected to variable speed Diehle motor and driving a 1-ton Brunswick Compressor

Send for Bulletin 101

The Poole Engineering & Machine Company

Manufacturers of Gears and Power Transmission Machinery Since 1843

Works: Baltimore, Md. **General Sales Office: 50 Church St., New York**

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MIDWEST MARINE POWER

HERE are some features of Midwest Marine Engines it will pay you to consider in figuring on the installation of new power equipment to move your vessel or auxiliary

Low Cost of Propulsion—is guaranteed because power is obtained cheaply from inexpensive crude or fuel oils.

Freedom from Breakdowns—is assured by the everlastingly dependable qualities of all Midwest equipment.

Flexibility of Operation—is obtained by means of simple, positive control for moving ahead or astern.

Inspection Made Easy—by the open crank case.

Adjustments Simplified—pistons and piston-rings remove without dismounting cylinder heads or connecting rods.

Write for detailed information concerning this or other Midwest products.

Oil Engine Products

For Stationary Service—Midwest-Hvid Oil Engines, Horizontal, Four-Cycle, Standard and Special Electric: 20, 25, 30 and 35 B. H. P.

Midwest-Diesel Oil Engines, Vertical, Four-Cycle, Belted or Direct-Connected for General Power or Electrical Service: 50, 75, 100, 150, 190, 250 and 375 B.H. P.

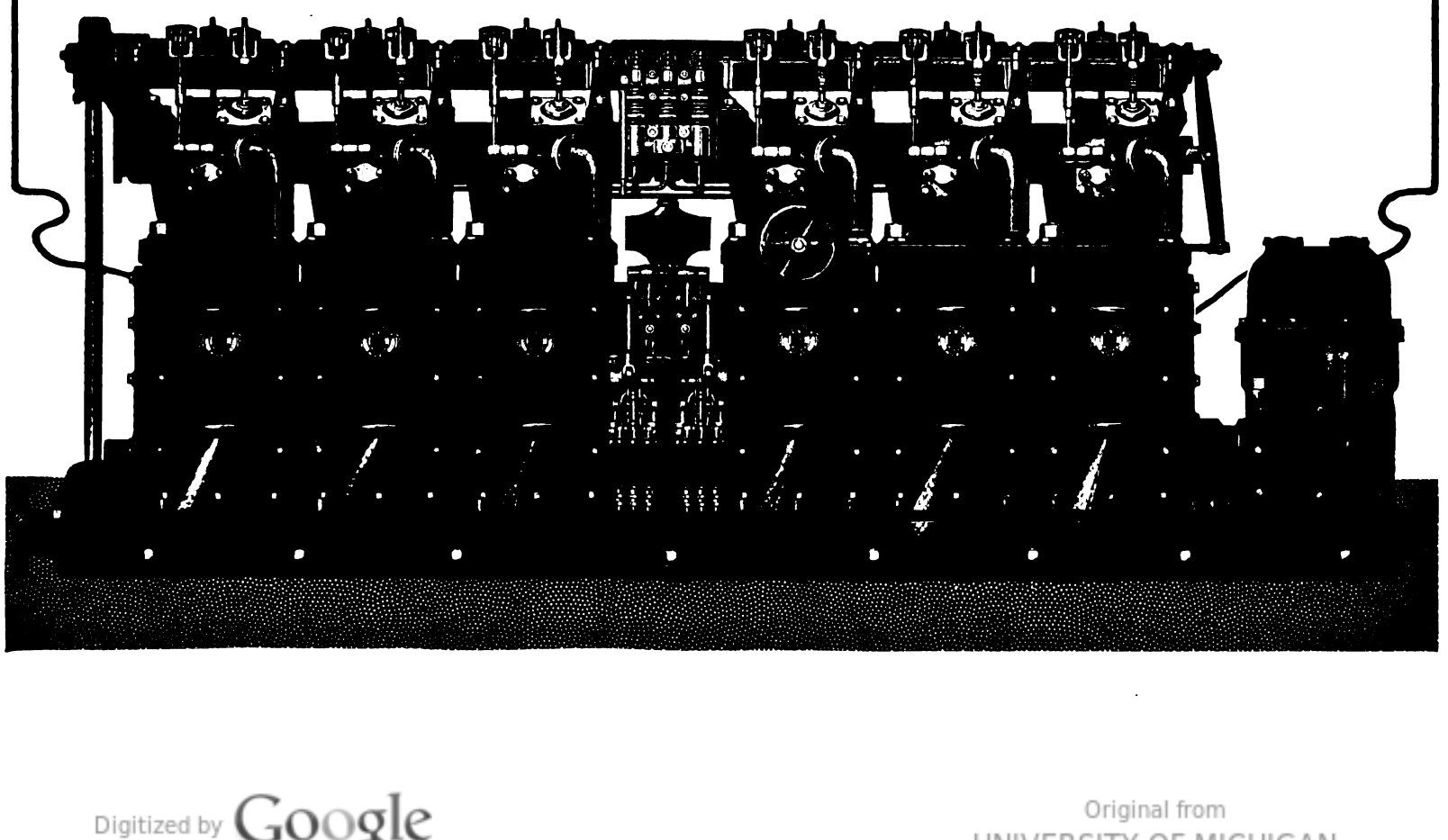
For Marine Service—Midwest-Diesel Oil Engines, Four-Cycle; Clutch Type: 60, 90, 120 and 180 B. H. P.

Midwest-Diesel Oil Engines, Four-Cycle, Directly-Reversible Type: 180, 240, 375 and 500 B. H. P.

MIDWEST
ENGINE COMPANY
INDIANAPOLIS. U. S. A.

New York
111 Broadway
New Orleans
617 Maison-Blanche Building
El Paso, Texas
303 Caples Building
Jacksonville, Florida
231 East Bay Street

Representatives in all principal cities



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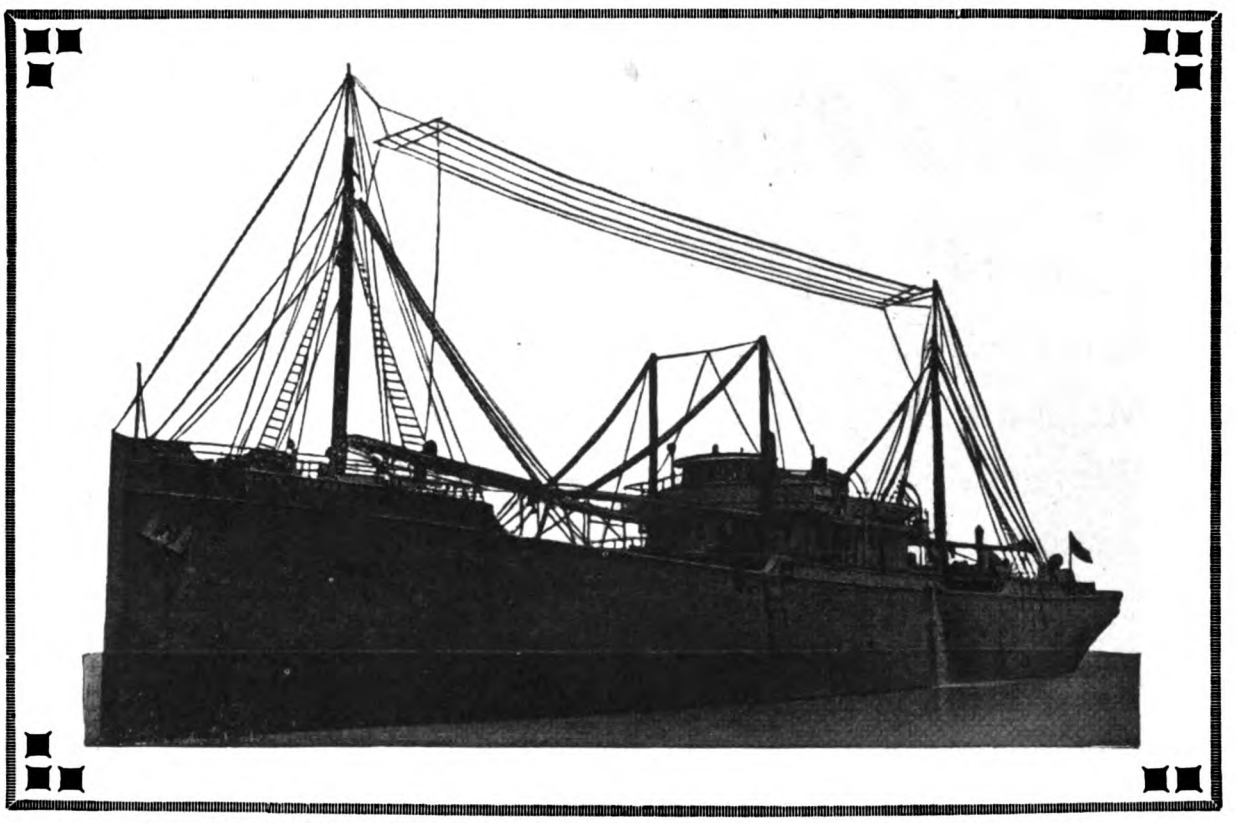
REDUCTION GEARS

FOR DIESEL-DRIVEN MOTORSHIPS



THE SUCCESSFUL 3,500 TONS MOTORSHIP "JAMES TIMPSON." HER TWIN PROPELLERS ARE DRIVEN BY DIESEL ENGINES THRO' FALK REDUCTION GEARS WHICH HAVE GIVEN HIGHLY SATISFACTORY SERVICE.

ORGANIZED ESPECIALLY FOR MARINE WORK

WE HAVE PROVIDED AND HAVE IN OPERATION A LARGE NUMBER OF VERY POWERFUL, SPECIAL PRECISION MACHINES FOR PRODUCING HIGH-SPEED GEARS AND GEAR CASES FOR MARINE WORK.

OUR EXCEPTIONAL CONSTRUCTIONAL FACILITIES

OUR EXCEPTIONAL FACILITIES FOR HANDLING MARINE WORK HAVE ENABLED US TO PRODUCE GEARS FOR THIS FIELD AGGREGATING MORE THAN 2,500,00 H.P., AND WE ARE NOW WORKING ON CONTRACTS AMOUNTING TO OVER 3½ MILLION H.P.

THE FALK COMPANY

MILWAUKEE, WISCONSIN, U. S. A.

M. P. FILLINGHAM
50 CHURCH STREET, NEW YORK CITY

F. W. GRIMWOOD
RIALTO BUILDING, SAN FRANCISCO, CAL.

W. O. BEYER
1024 PARK BUILDING, PITTSBURGH, PA.

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CAMMELL LAIRD & Co LTD.,
BIRKENHEAD

MARINE AND LAND OIL-ENGINES
(CAMELLAIRD—FULLAGAR SYSTEM)

ADVANTAGES CLAIMED

50% more Power in same space over other engines
Low Revolutions and High Propeller Efficiency
Even Turning Moment and Perfect Balance
No direct stresses on framing as Piston Loads are Balanced
Loads on all pins Reversible, Ensuring Efficient Lubrication
Only one Working Valve per Cylinder. No Vibration

SIMPLE SILENT RELIABLE
Suitable for all Classes of Merchant Vessels

LONDON 3 CENTRAL BUILDINGS, WESTMINSTER. S.W. 1.

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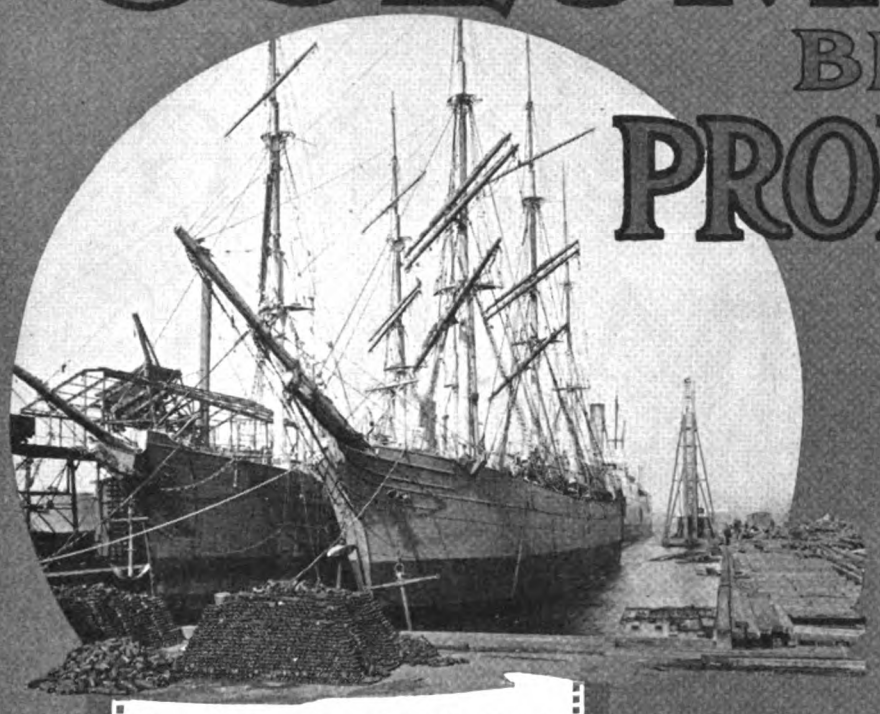
COLUMBIAN BRONZE PROPELLERS



Photograph by courtesy of Morse Dry Dock & Repair Co.

"Spica," illustrated above, is a typical example of the type of boat now using Columbian Bronze Propellers in place of cast iron wheels.

Built in 1877 by Harland & Wolff as a steel Sailing schooner, converted in 1919 to a Motorship by the Morse Dry Dock & Repair Company and equipt with the Columbian Bronze Propeller illustrated in the right hand corner herewith.

"Spica," 230 ft. x 36 ft. x 22 ft. — 1332 tons, now equipt as a Motorship with a bronze propeller, is a mighty efficient ship.

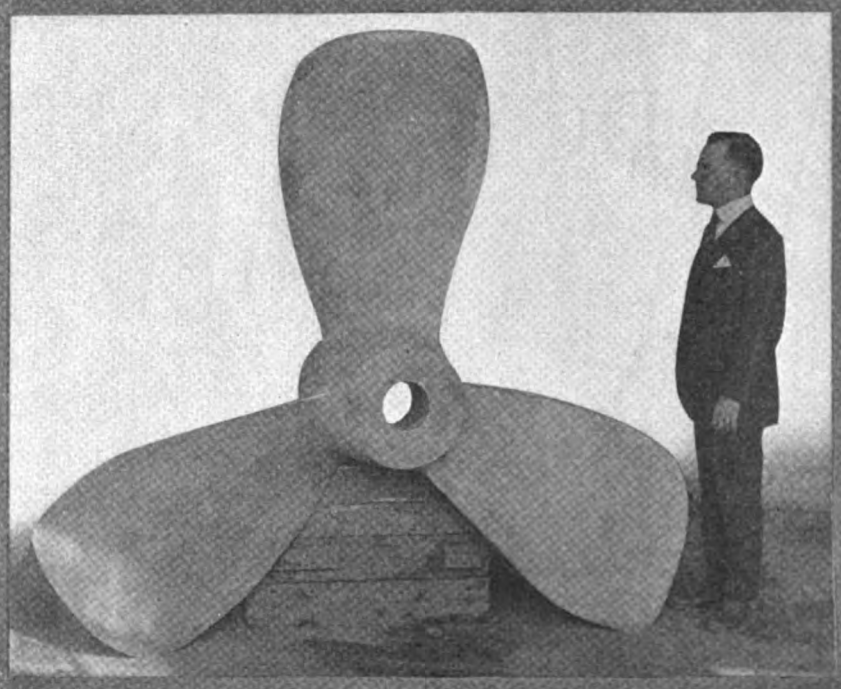
Your ships will be better ships, more efficient ships, more dependable ships, if they are equipt with Columbian Bronze Propellers.

WE manufacture complete Steamship and Motor Ship Propeller Equipment including propellers; intermediate and tail shafts in bronze and steel up to 10" in diameter, in bronze up to 5"; shaft couplings; stern tubes; stern bearings, babbitted or lignum vitae lined—all to Lloyd's specifications where required, or to your specifications otherwise.

Write for the NEW Columbian Catalog —it's well worth having and it's FREE.

COLUMBIAN BRONZE CORPORATION

Executive Office: 50 Church Street, New York City



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DOWNEY SHIPBUILDING CORPORATION

BUILDERS of steel steamships of any size or type up to about 15,000 D. W. tons. Shipbuilding capacity for 1920 deliveries, 100,000 to 120,000 D. W. tons.

Builders of marine reciprocating steam engines and auxiliaries. Steamship repairs.

Structural steel fabrication, bridge work, steel building frames and miscellaneous structural steel.

Negotiations invited for the construction of large motor ships.

DOWNEY SHIPBUILDING CORPORATION

Address: Shipyard, Arlington, Staten Island, N. Y.

Cable Address: "Downeyship," New York

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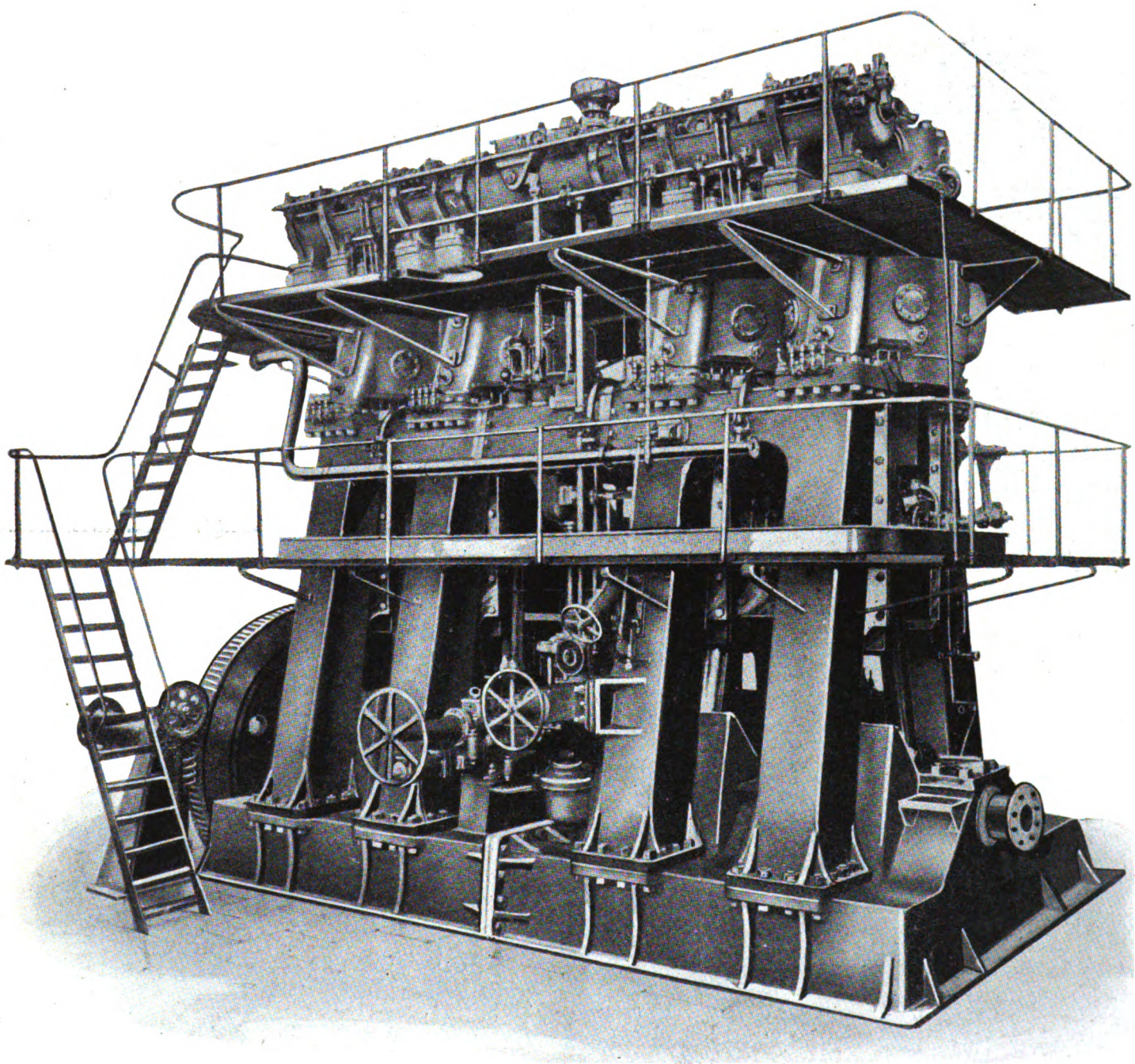
Two-cycle Reversible Diesel Marine Engines

The name Nordberg, in connection with the designing and building of prime movers, is so well known to engineers that it is not necessary to say that these Diesel Marine Engines, built by Nordberg, in sizes from 330 to 3000 B.H.P., are thoroughly dependable and economical.

Nordberg efficiency and stamina are built into these engines, as well as into Nordberg stationary engines (220 to 4000 B.H.P.).

Nordberg Mfg. Co., Milwaukee, Wisconsin



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NEW LONDON SHIP & ENGINE CO.

GROTON, CONN., U.S.A.

Builders of High Grade Heavy Duty Type

Marine Diesel Engines

PASSENGER VESSEL "NELSECO II"

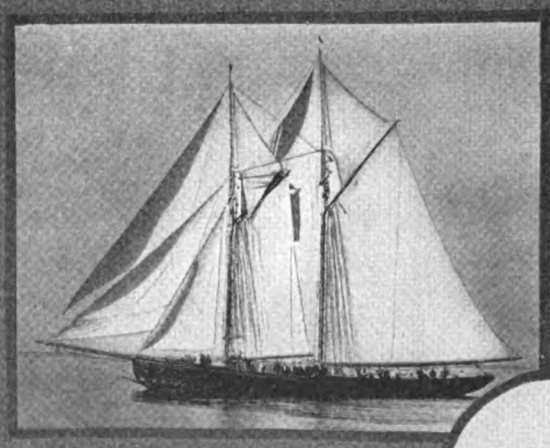
TUG "CHICKAMAUGA"

U.S.S. "FULTON"

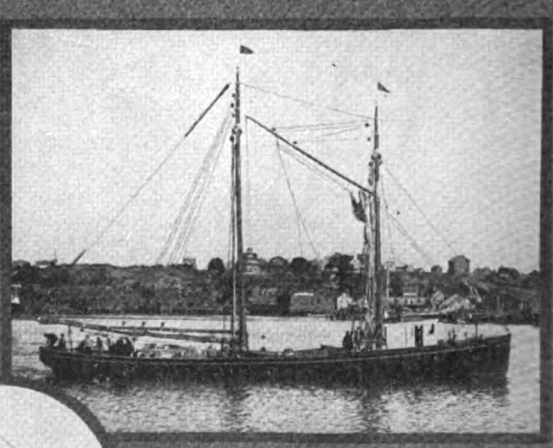
CANNERY TENDER WARRIOR

America's First Marine Diesel Engine Builders
Over 150,000 B.H.P.
Now In Use or On Order
Sizes 120 H.P. and Upwards

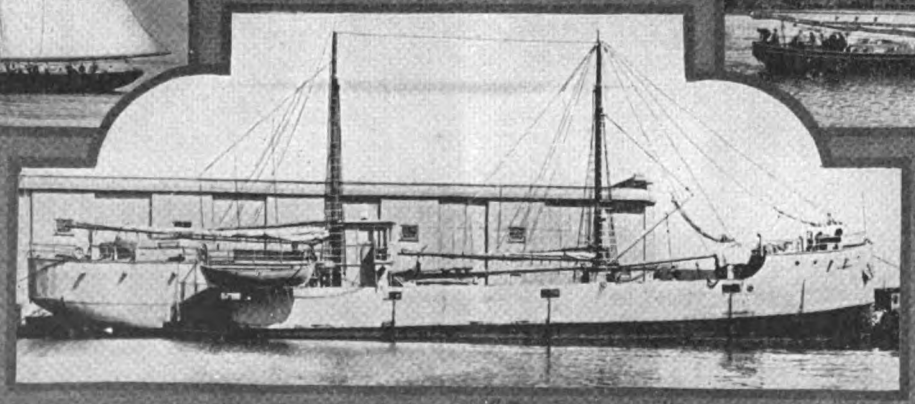
YACHT "IDEALIA"



FISHING SCHOONER "MANHASSETT"



FISHING SCHOONER "LUCIA"



CARGO VESSEL "CERRITO"

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They liked the first "C-O" engine so well that they bought five more

The Southern Alaska Canning Company recently took out a well-known make of Distillate Engine from the "Alf"—shown above—and replaced it with a Fairbanks-Morse 75 H. P. "C-O" Oil Engine.

This makes the sixth boat that this Company has powered with "C-O" engines. They are not guessing. Their records for several years prove "C-O" engine economy—and efficient operation on low priced fuel oils.

The other boats are the "Fanshaw"—"Einar Beyer"—"Petrol"—"Shamrock II"—"Shamrock III."

Our claims might have sold the first engine—but it was "C-O" Engine performance that caused them to buy the last five.

Guaranteed by Fairbanks-Morse Quality

Fairbanks, Morse & Co.
MANUFACTURERS CHICAGO

Engines - Pumps - Motors - Hoists - Air Compressors - Fairbanks Scales - Sheffield Motor Cars - Standpipes - Coaling Stations - Etc.

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VICKERS

Solid Injection Marine Oil Engines

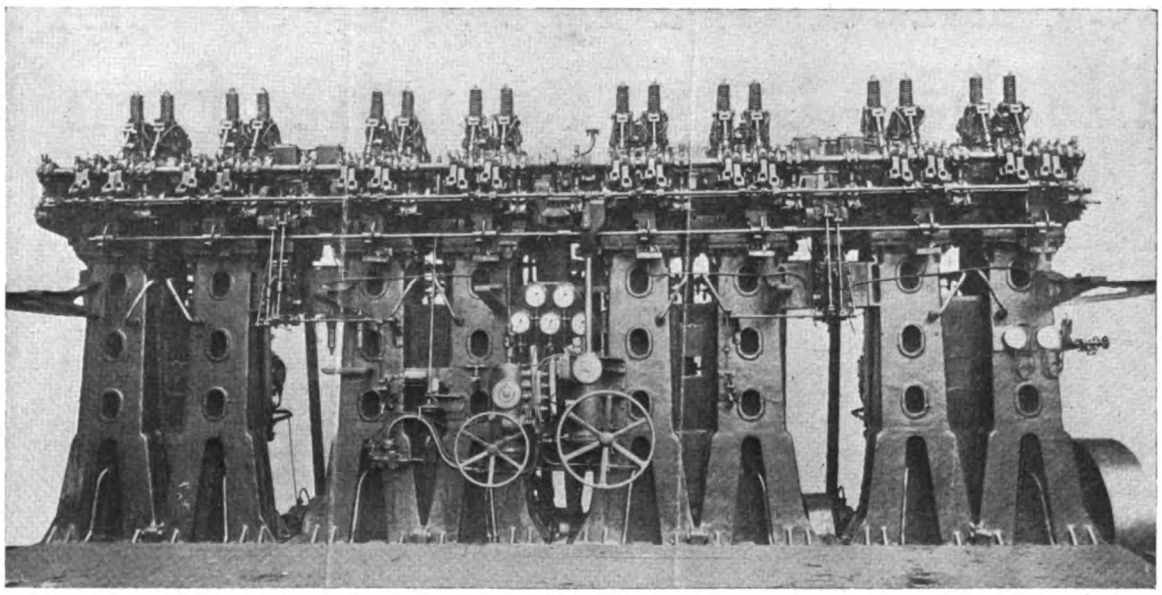
ALL THE ADVANTAGES of the Diesel Engine without the danger and complication of the Blast Air Compressor.

ALL THE ADVANTAGES of the Surface Ignition Engine without delay in starting, troublesome lamps, or hot bulbs.

LOW FUEL CONSUMPTION—down to 0.38 lbs. per brake horse power.

(This corresponds to 0.28 lbs. per indicated horse power in the ordinary Air Injection Diesel Engine).

Vickers Limited, who have been in the High Power Marine Oil Engine Industry since its early days, and are the Designers and Licensors of the British Submarine Engines, have not fitted an Air Compressor to their Marine Diesel Engines since 1911. Nearly 400,000 B.H.P. in large units constructed.



A REMARKABLE RECORD.

The above photograph shows one of six similar solid injection engines supplied during the War. It develops 750 B.H.P. on Texas fuel at 150 R.P.M. The ship was run on service so urgent that for 18 MONTHS NO BEARING OR CYLINDER WAS OPENED, and apart from occasional grinding-in of the spray valves, THE ONLY VALVE OPENED WAS ONE EXHAUST VALVE for easing of the spindle. Yet the engines were "running like clockwork" when the failure of the Auxiliary STEAM plant led to the ship being laid up for overhaul. Vickers' merchant ship engines are improvements on these.

VICKERS LIMITED.

HEAD OFFICE, BROADWAY, LONDON, S. W. 1.

MARINE ENGINE WORKS, BARROW-IN-FURNESS, ENGLAND

NEW YORK OFFICE:

2550 WOOLWORTH BUILDING, NEW YORK, N. Y.

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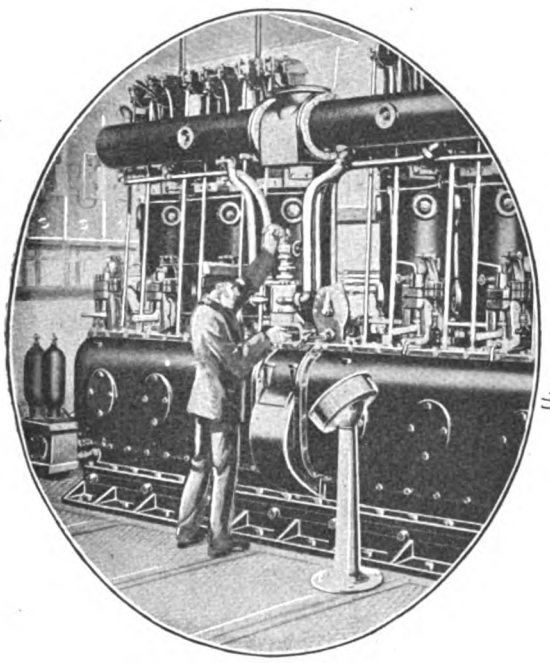
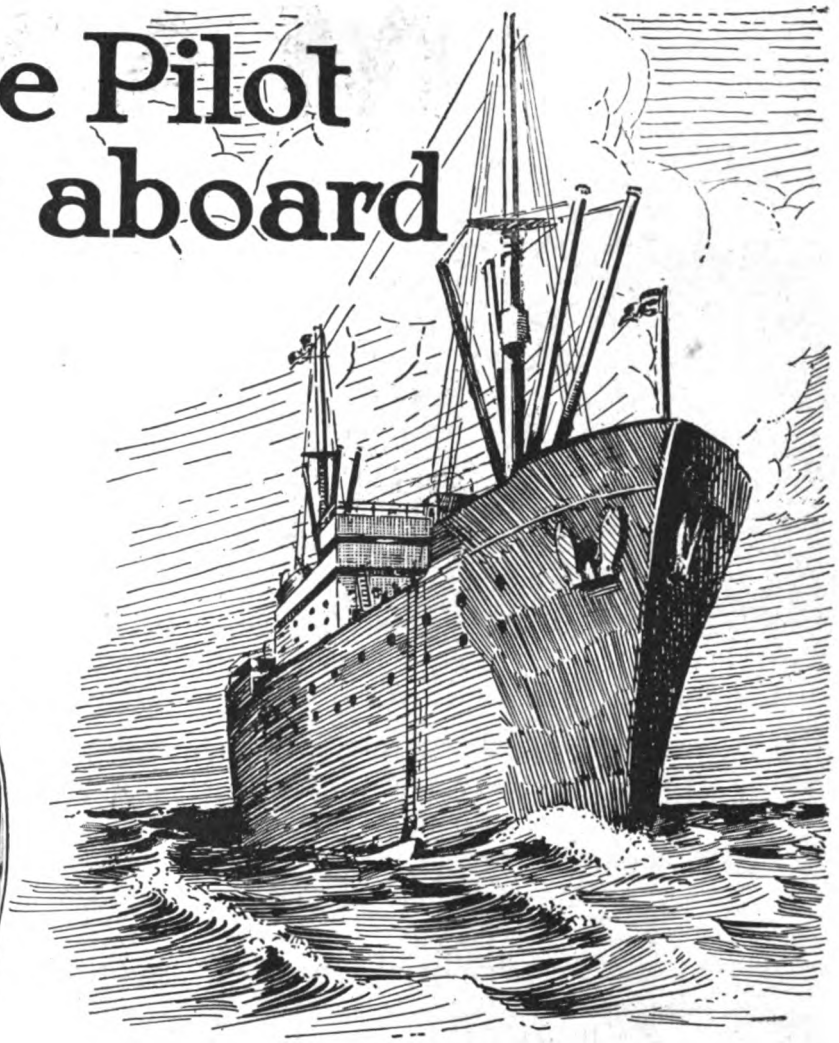
When the Pilot Comes aboard





The pilot comes aboard when the ship is passing through the channel. Sometimes the latter is broad and straight and it is all plain sailing, but more often it is narrow and with sharp curves, making necessary frequent changes of speed, starts, stops and reversals.

Such manoeuvering constitutes a severe test of the ease with which your engines may be handled. If they do not respond almost instantaneously to the signals from the bridge, it may mean a delay of hours or days. And in any emergency, you want to be sure that at any time your engines are going to prove instantly responsive to the bridge telegraph.

Ease of control and rapidity of manoeuvring are characteristics of the P-R Type of Heavy-Oil Engines. There are no levers to throw, nothing indeed to manipulate except two quick-opening valve handles, and a small wheel having thirty degrees as its maximum turn. The entire apparatus is so simple that anyone can operate it.

In addition to its ease of control, the P-R Engines possess a remarkably high fuel economy, and has superior mechanical features which will commend them to your serious consideration. In fairness to yourself, you cannot afford to decide on any type of engine for your ship until you have thoroughly investigated the P-R.

We will be glad to furnish you with additional information.

INGERSOLL-RAND COMPANY

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APPLY TO NEAREST OFFICE

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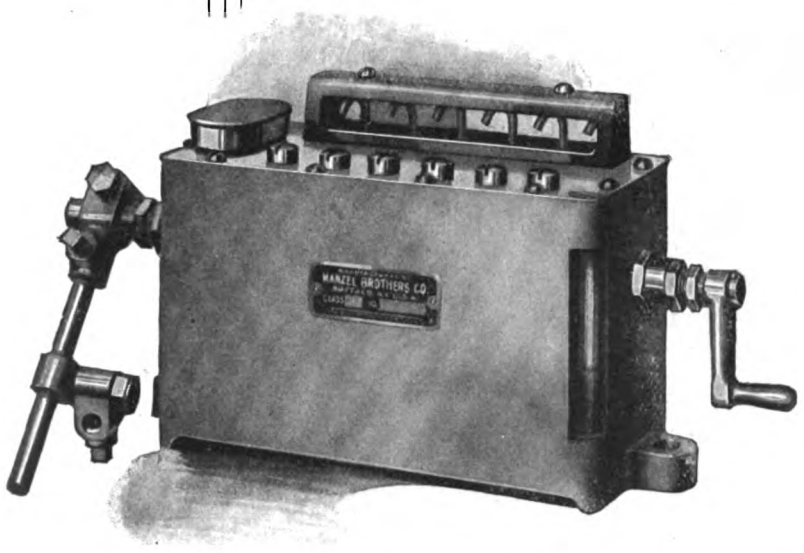
MANZEL



Force-Feed Oilers—

Lubricate Diesel Engine Cylinders and Bearings the Right Way

MANZEL Force-Feed Oilers supply fresh, clean oil to the engine cylinders and bearings regularly, and in just the right quantities.

Start automatically with the engine, stop with it and always adjust themselves to the engine's speed.

Are easily and accurately adjusted, while the engine is running, to supply any amount of oil required.

Will supply large or small quantities with equal regularity, each feed being adjusted independently.

Never fail to lubricate—won't waste oil.

Built on the Piston Valve Principle

MANZEL Oilers contain no ball valves, small springs or checks, and have no complicated mechanism.

They are operated on the piston valve principle, and are the only oilers of this kind on the market.

Simple in construction—absolutely positive in operation. Will pump against any pressure developed on a Diesel Engine.

May be run in either direction—will handle heavy or light oil—operate at high or low speed—will work equally well in any temperature.

Made in sizes and styles to fit any engine

Manzel Oilers can be furnished with any number of feeds and with rotary or ratchet drive.

Can also be furnished with direct drive to operate in synchronism with the engine if desired.

Engines lubricated with Manzel Oilers last longer—run smoother—have more power—use less oil

Write for Catalogue

Manzel Brothers Company

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Builders of

Marine Engines—River, Harbor and Gold Dredges
Hoisting Machinery—Marine Machine Works

AND

Specialists in the Overhauling and Repair of Marine Oil Engines

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37 TO 51 WEST LANDER STREET
ON THE EAST WATERWAY

SEATTLE MACHINE WORKS
INCORPORATED

Cable Address: Smachyco

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THE PANAMA CANAL LINE

ALL SAILINGS BETWEEN U. S. ATLANTIC AND U. S. PACIFIC PORTS CANCELED UNTIL FURTHER NOTICE

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By the Welder that successfully repaired the German Ships

Any damaged or broken parts of a ship can be quickly repaired **in place** by the Wilson **Plastic-Arc** Welder.

Wilson outfits are now a part of the regular equipment of a large number of United States Navy vessels, and also of some of the larger transports and other steamers.

A Wilson Welding outfit on board makes unnecessary a large and bulky stock of new parts, as any damaged parts of a ship, from mere details to massive parts, can be readily and lastingly repaired with the Wilson Welder, whether the ship is at sea or at her dock.

Telephone us the next time in the case of a damaged or broken part, scored piston rod, leaky boiler flues or seams, or, in fact, when any repairs of any kind are necessary and let us demonstrate on your own ship, how readily the Wilson Welder can make lasting repairs.

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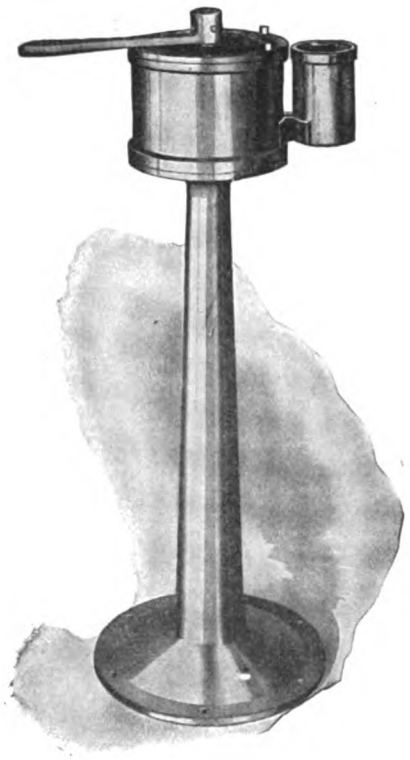

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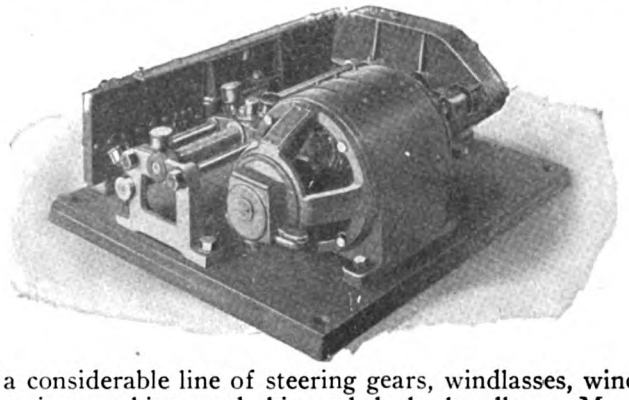
is the ideal form of transmission. It insures more sensitive control and greater ease of operation than any other. It relieves you of worry about air traps or temperature conditions. It eliminates the necessity of keeping a long line of shafting and gears in perfect alignment. Stretching will not in any way lessen its effectiveness, so that point need not worry you. It is so simple that it is almost impossible to get it out of order. It is very inexpensive in operation because it uses a very small amount of current. Ask us to tell you more about **HE BENSON ELECTRIC TELEMOTOR.**

The Benson Electric Telemotor



We build a considerable line of steering gears, windlasses, winches, capstans and gypseys, towing machines and ship and dock chandlery. May we put your name on our mailing list for the new catalog soon to be issued?

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Philadelphia, Pa.

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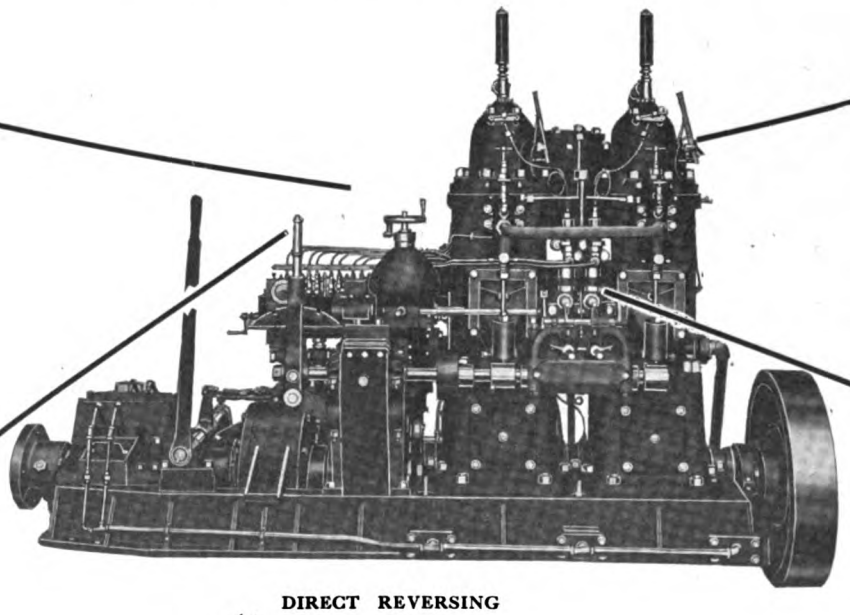
HEAVY OIL ENGINES

DIRECT ACTING GOVERNOR
A large slow speed centrifugal governor acts thru shaft on wedges, controlling stroke of fuel pumps. Adjustment of each cylinder or all cylinders can be made while engine is running.

SLIDING CAM SHAFT CONTROL
The control lever and cam shaft perform all of the operations of starting, running, reversing, and stopping. The cam shaft is supplied with two complete sets of cams, reverse and forward timing. The hand lever controls position of cam shaft.



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ELECTRICAL STARTING PLUG
This device enables the engine to be started almost instantly (from 30 to 35 seconds), doing away with the old heating torch entirely. After the engine starts the coil is covered.

ACCESSIBLE FUEL PUMPS
Of sturdy construction and are located in a position where they can be easily adjusted while engine is running.

NEW YORK

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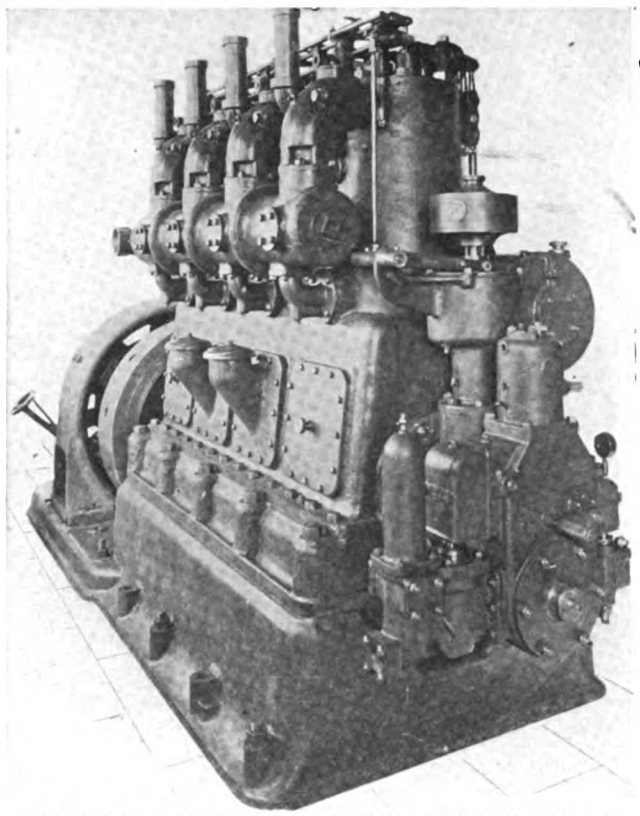
PITTSBURGH HEAVY DUTY OIL ENGINE

FOR PROPELLING COMMERCIAL VESSELS OF ALL TYPES



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FOR ENGINE-ROOM AUXILIARY MACHINERY OF ALL KINDS

WE ARE OPEN FOR A LIMITED NUMBER OF DISTRIBUTORS IN THE UNITED STATES AND ABROAD AND WILL BE PLEASED TO RECEIVE APPLICATIONS FROM RESPONSIBLE FIRMS

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Crossing the ocean is nothing for the Standard engined U. S. N. 110-ft. submarine chasers; from New York straight to France, or to Bermuda, the Azores and on into the Mediterranean, the Aegean and the Adriatic

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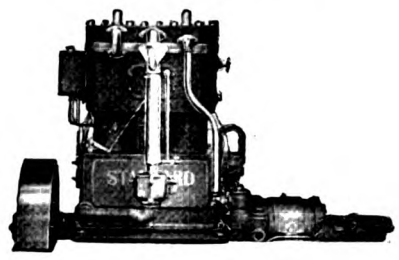
is the official navy record of submarines sunk by 110-ft. S. C. boats — *40% of the total*



THE STANDARD ENGINE

which has served throughout the war in all of the 80-ft. and 110-ft. British, French, Italian and U. S, submarine chasers will serve you in the same history-making way. Early deliveries on early orders.

Back of the Standard Guarantee is the

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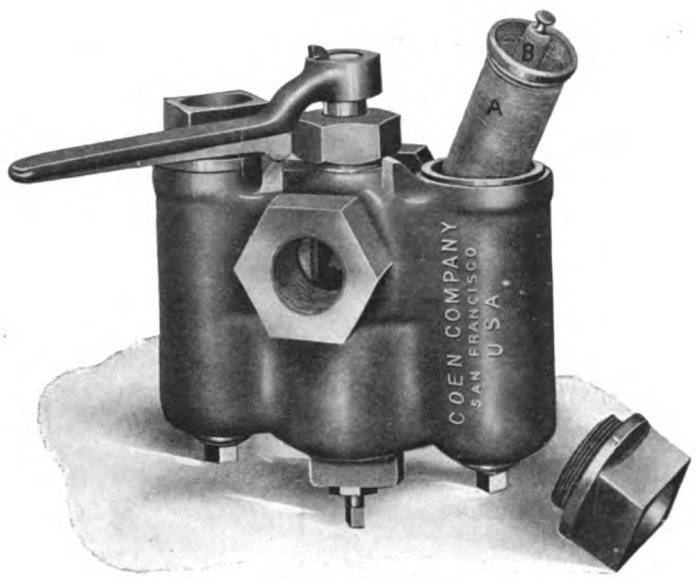

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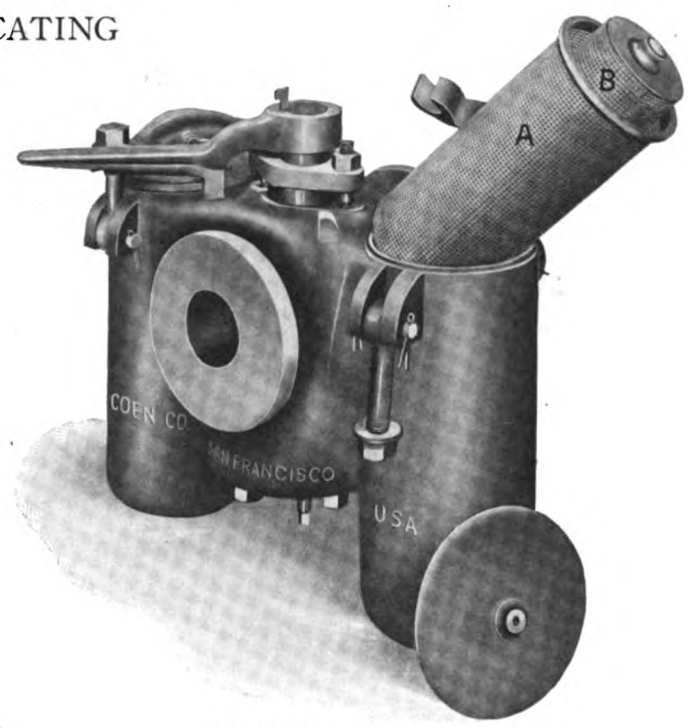

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OIL BURNING SPECIALISTS

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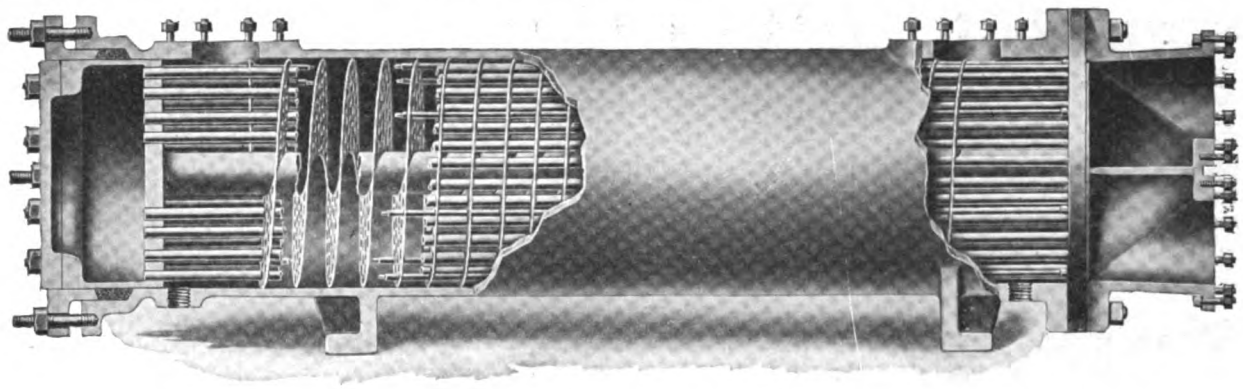

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For the General Cooling of Lubricating Oils

CONSTRUCTION

Oil in shell—cooling water in tubes—entire tube bundle removable.

Helical Baffle—long, smooth oil path—minimum pressure drop.

Tubes expanded into tube plates—no sweated joints.

Outside packed floating head—no expansion strains—no internal joints—impossible for water to leak into oil.

Extreme compactness due to high rate of heat transfer.

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FOUR-CYCLE DIESEL-TYPE

MARINE OIL ENGINES

JAMES CRAIG ENGINE AND MACHINE WORKS

807 GARFIELD AVENUE JERSEY CITY, N. J., U. S A.

J. F. DUTHIE & CO.

SHIPBUILDERS and ENGINEERS

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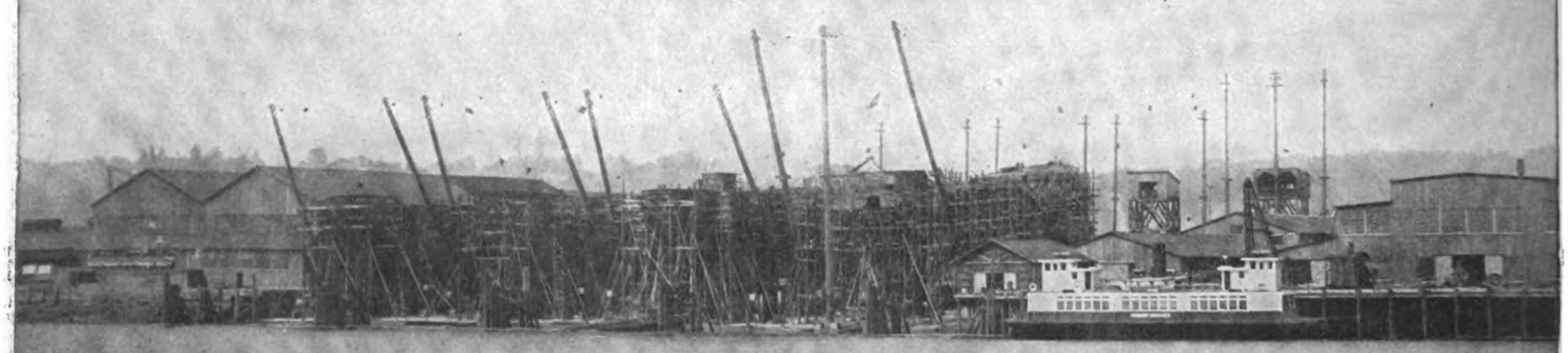
Kitsap Avenue, East Waterway **Seattle, Wash.**



General view of Duthie Plant, Seattle

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MARINE
VICKERS-PETTER
OIL ENGINES

Motorship "Hibernia," 360 tons cargo, equipped with 152.b.h.p. Vickers-Petter Marine Oil Engine.

ARTHUR TATE & CO., LTD.,
Exporters of Coal, Coke,
Bricks and Salt.

NEWCASTLE-ON-TYNE,
24th October, 1919.

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Referring to the 152 b.h.p. Internal Combustion Engine supplied by Messrs. Vickers-Petter and installed into our iron vessel "Hibernia," 360 tons cargo, we have much pleasure in advising you that up to the present, namely, after the fourth voyage to France with coal cargoes, the engine has been proved to be of first-class workmanship and has run smoothly the whole time.

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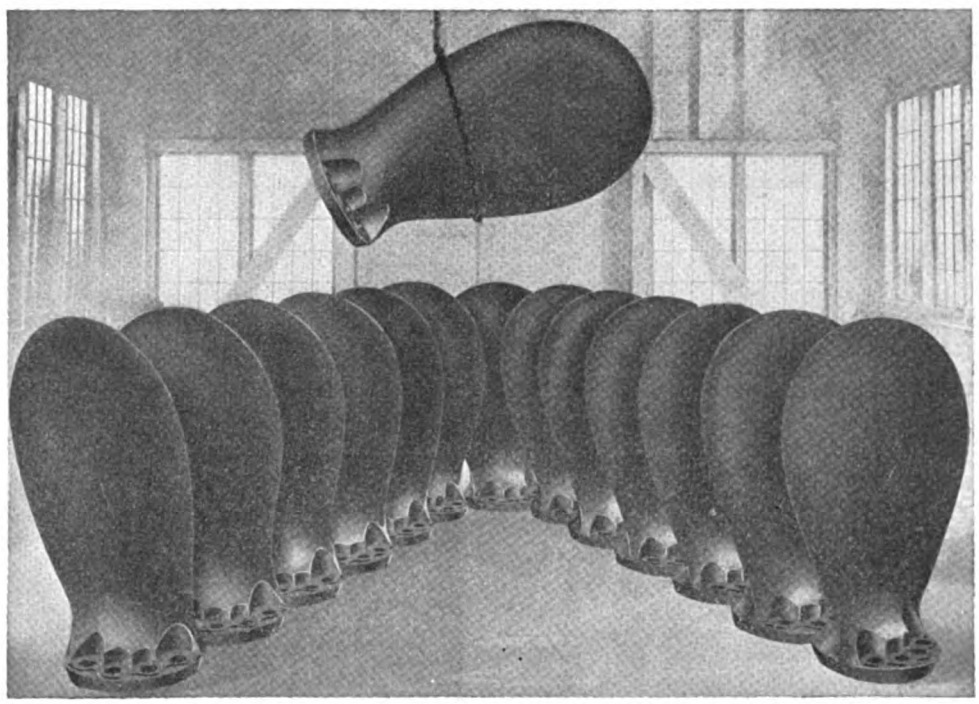

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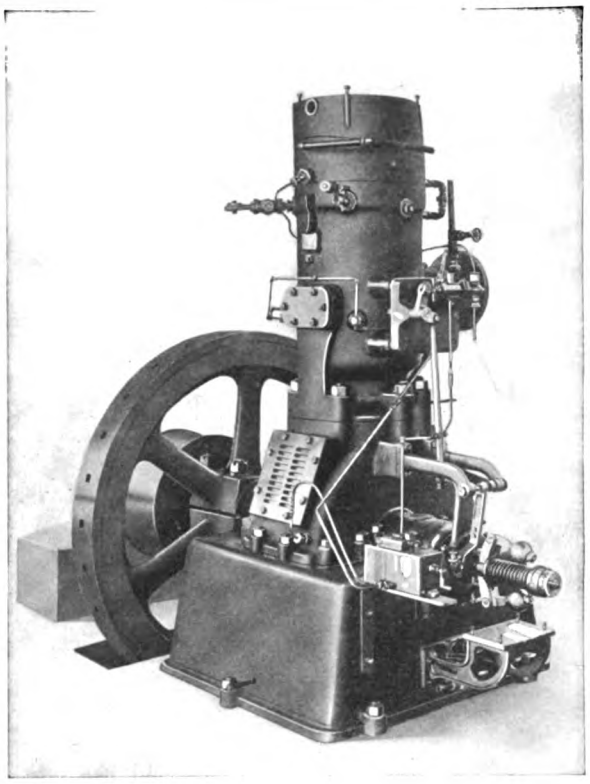

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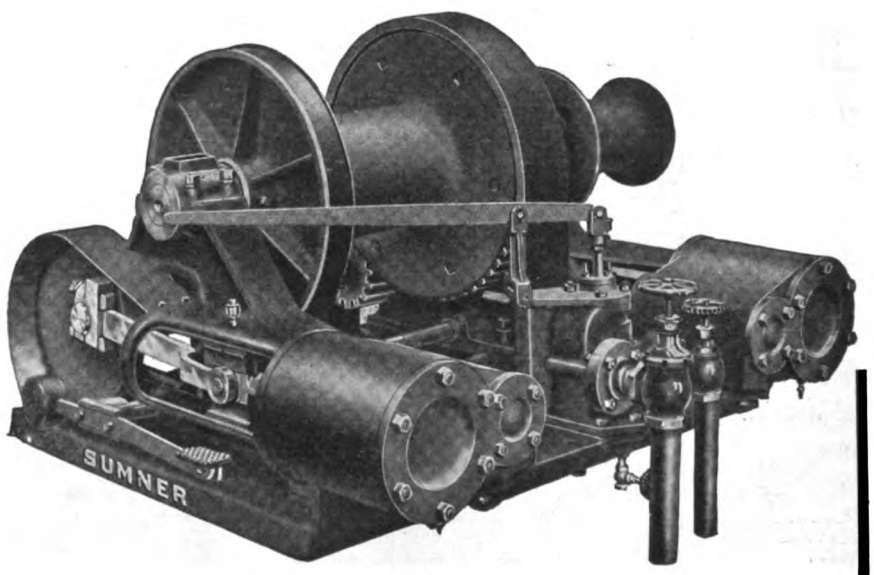

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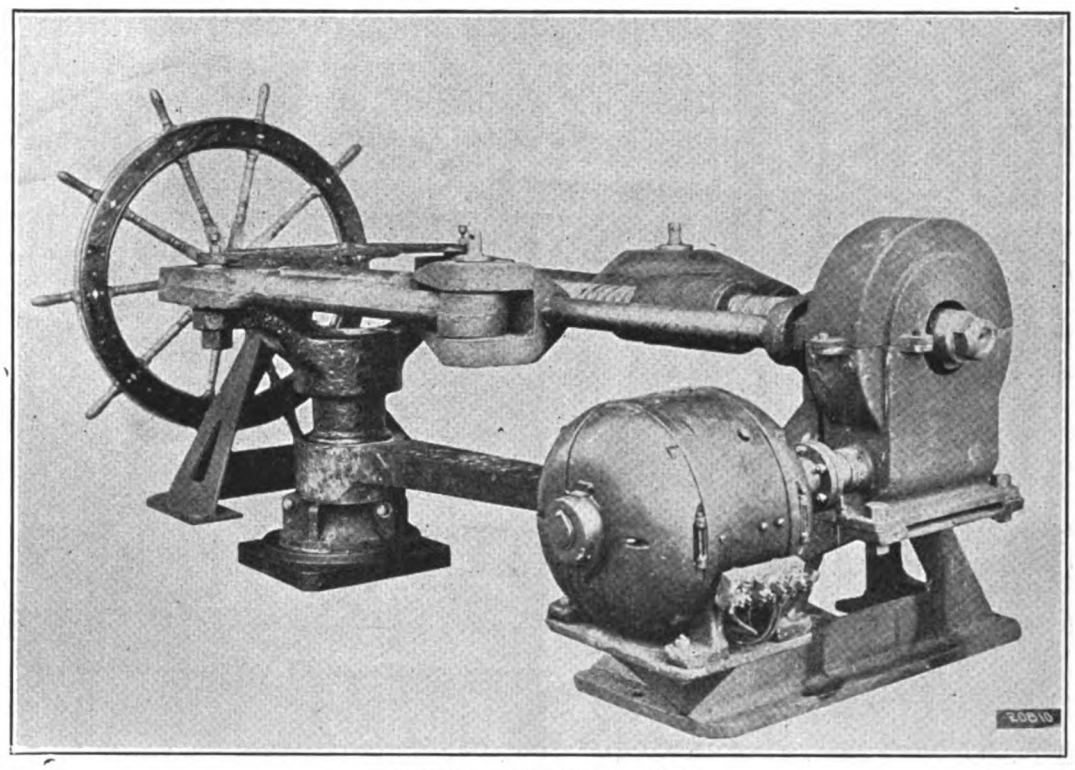

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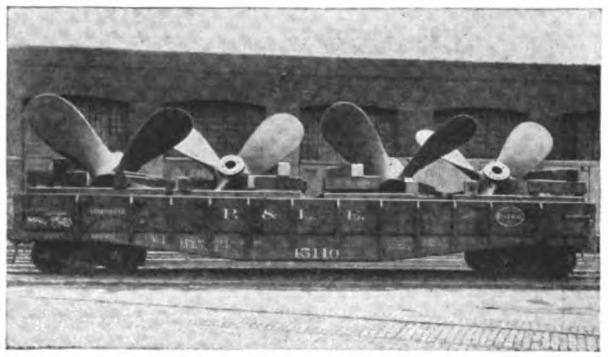

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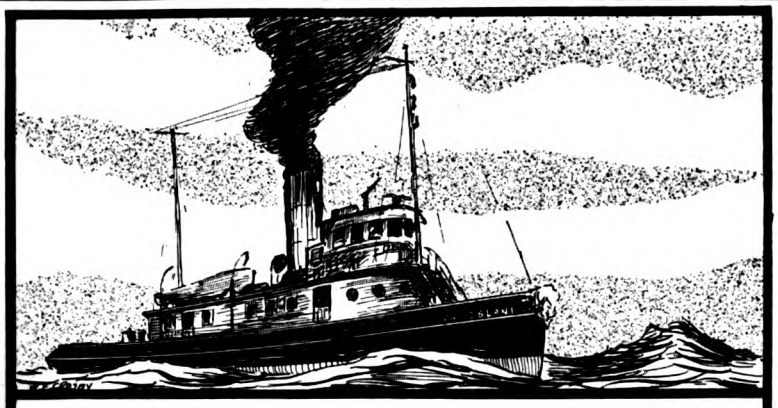

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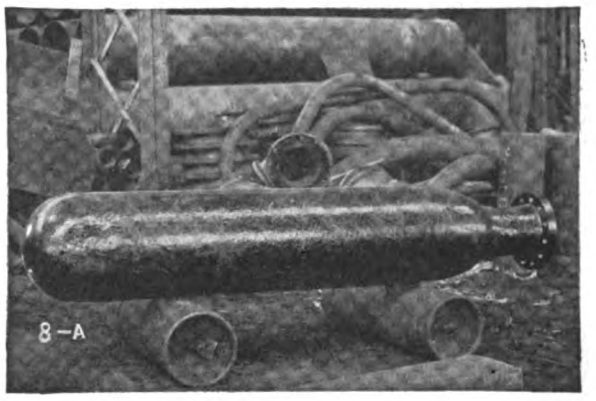

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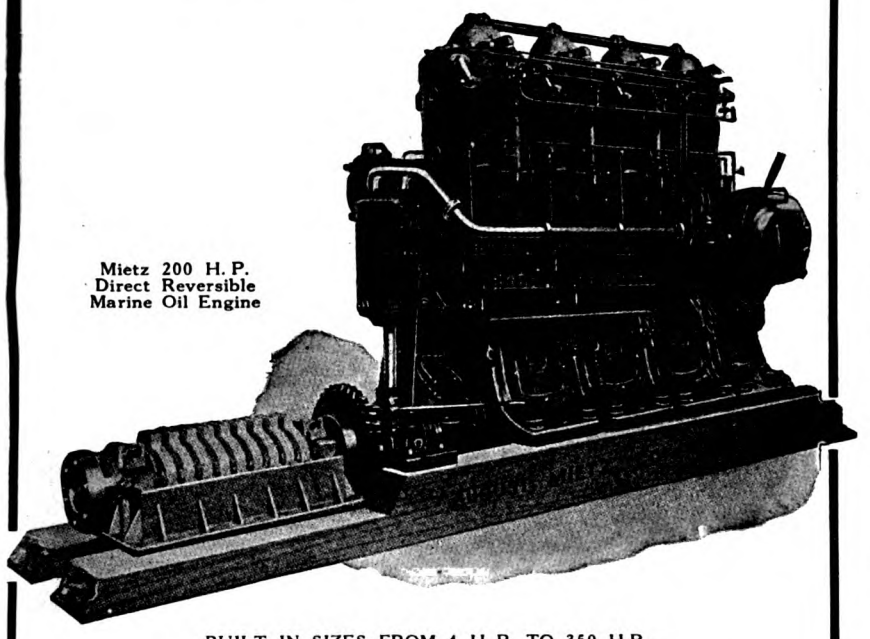

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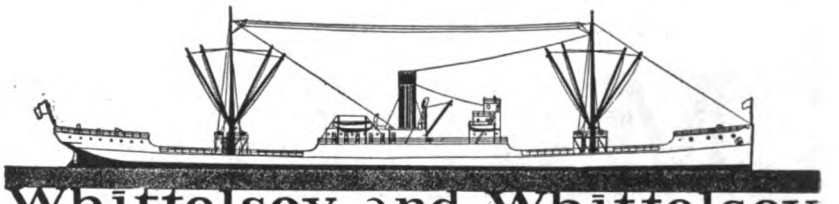

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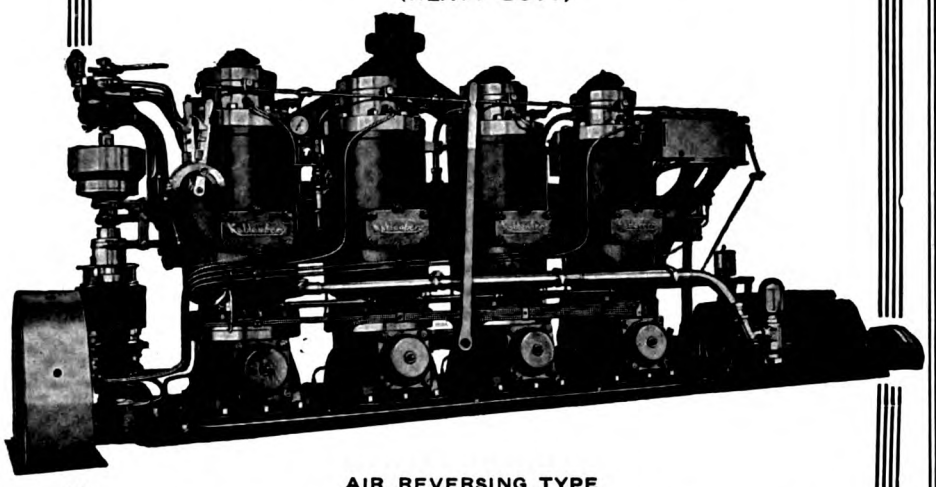

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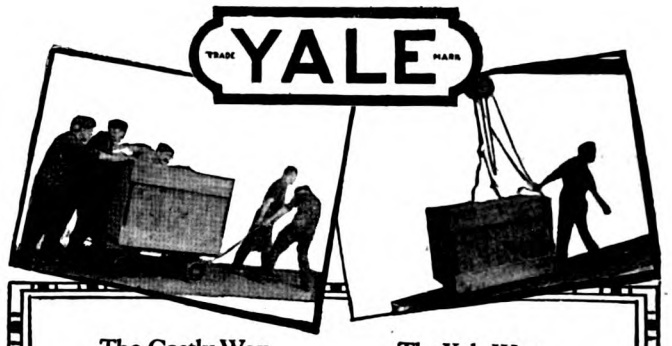

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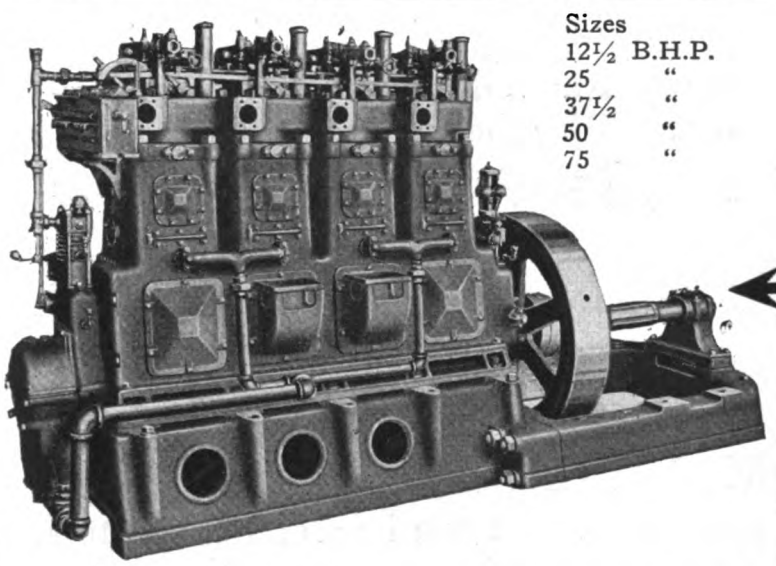

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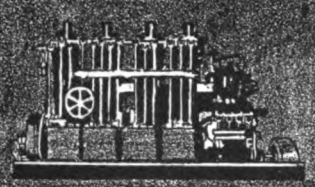

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Of "Motorship," published monthly at New York, N. Y., for October 1, 1919.

STATE OF NEW YORK } ss.
COUNTY OF NEW YORK }

Before me, a Commissioner of Deeds, in and for the State and county aforesaid, personally appeared Miller Freeman, who, having been duly sworn according to law, deposes and says that he is the President of Miller Freeman & Co., Publishers of "Motorship," and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the Publisher, Editor, Managing Editor, and Business Managers are:

Publisher, Miller Freeman & Co., 1270 Broadway, New York, N. Y.; Editor, T. Orchard Lisle, 1270 Broadway, New York, N. Y.; Managing Editor, T. Orchard Lisle, 1270 Broadway, New York, N. Y.; Business Manager, Russell Palmer, 71 Columbia St., Seattle, Wash.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

Miller Freeman, 71 Columbia St., Seattle, Wash.; T. Orchard Lisle, 1270 Broadway, New York, N. Y.; Russell Palmer, 71 Columbia St., Seattle, Wash.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is.....
(This information is required from daily publications only.)

MILLER FREEMAN, President.

Sworn to and subscribed before me this 8th day of October, 1919. (Seal) LOUIS RUELBERG, No. 129.

Form 3526.—Ed. 1916.

(My commission expires Sept. 22, 1921.)

NOTE.—This statement must be made in duplicate and both copies delivered by the publisher to the postmaster, who shall send one copy to the Third Assistant Postmaster General (Division of Classification), Washington, D. C., and retain the other in the files of the post office. The publisher must publish a copy of this statement in the second issue printed next after its filing.

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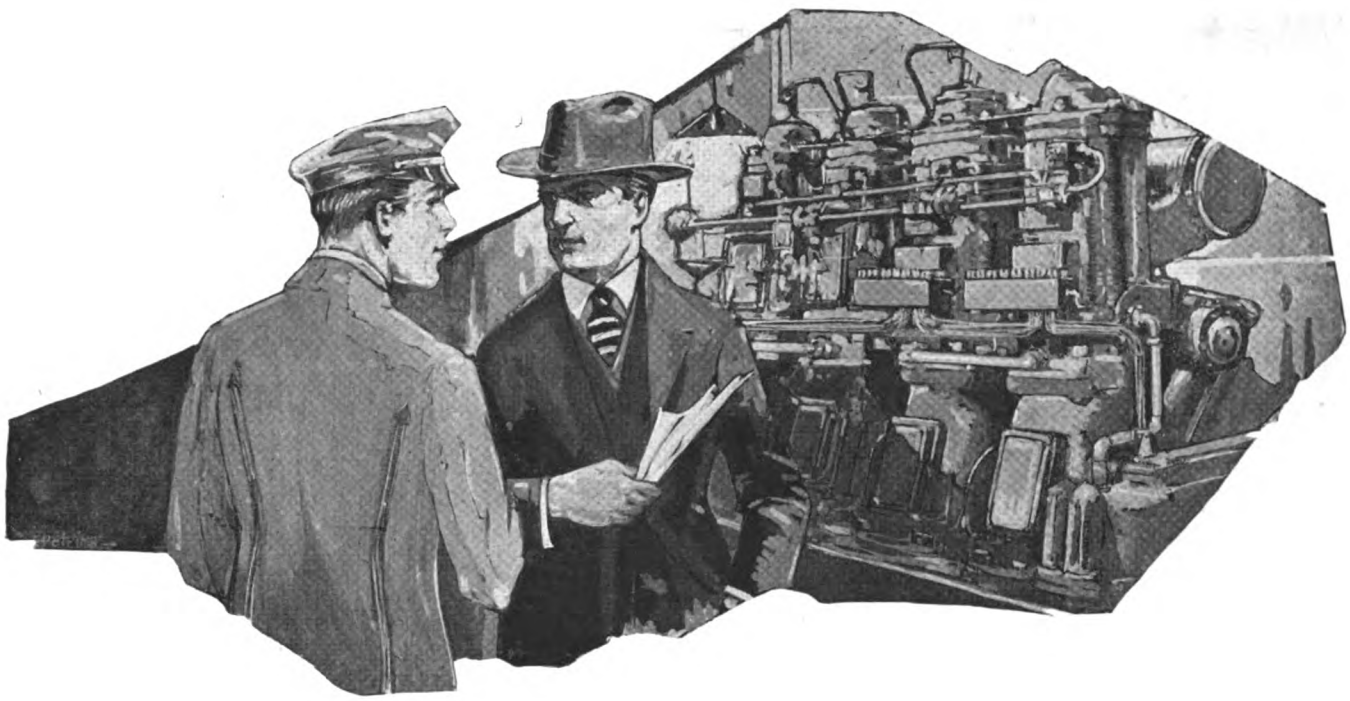

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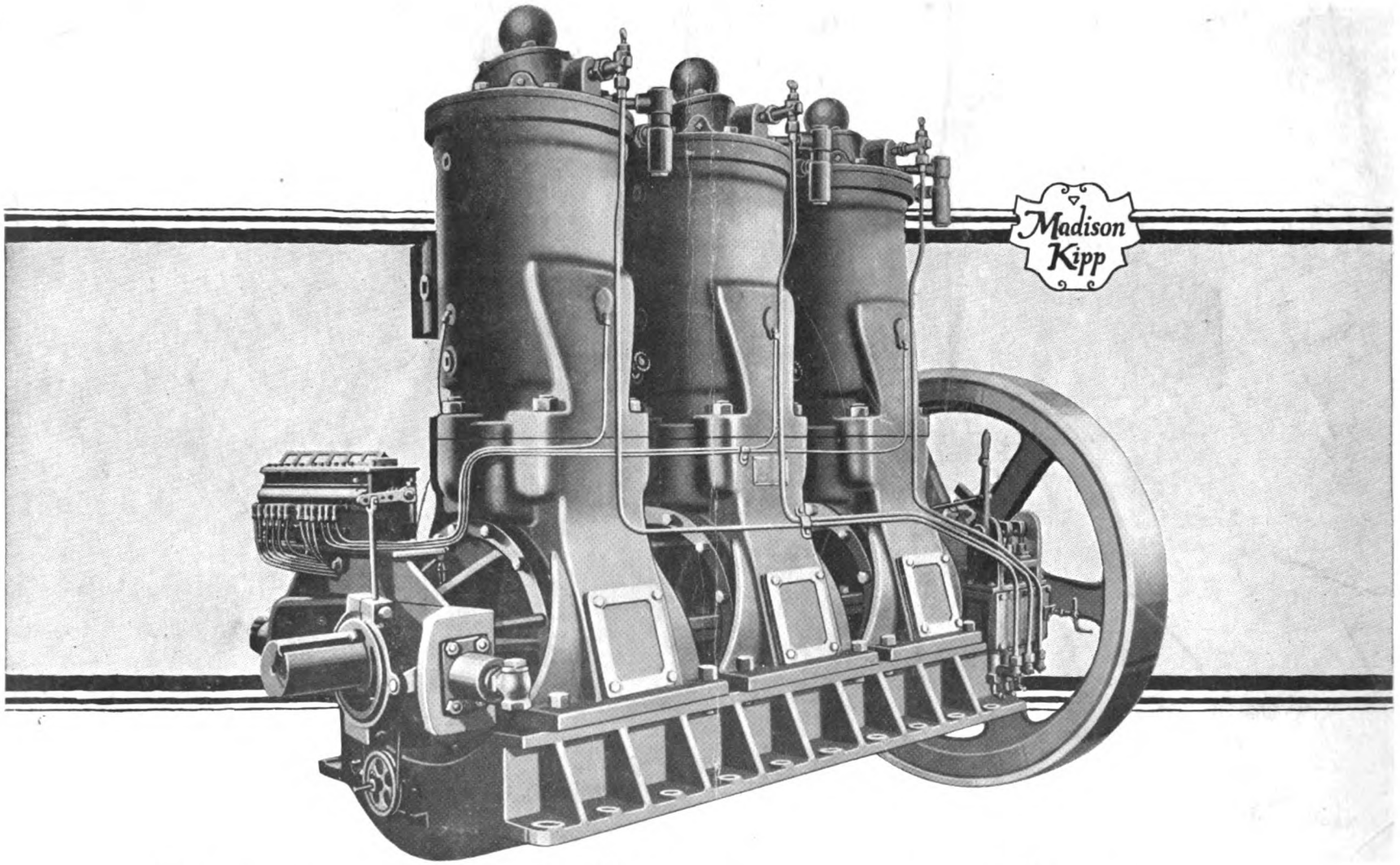

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